STUDIES ON THE FAUNA OF CURAÇAO AND OTHER CARIBBEAN ISLANDS: No. 131.

THE DERMAPTERA OF THE CARIBBEAN

by

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INTRODUCTION

The most complete survey of the Dermaptera of the Caribbean is that of REHN & HEBARD (1917), which mainly dealt with material collected on behalf of the American Museum of Natural History, but additional records from specimens in other American Institutions were included. This publication did not include all previous records and keys to the species were not given, apart from a short key to some names which were regarded as being forms of *Carcinophora americana* (Beauvois). A number of subsequent papers on the Dermaptera of these islands have been published, these papers either giving records from a single island or recording species from various islands, but no comprehensive survey of the known Dermaptera has been compiled. The islands of the Caribbean form an interesting area, and a comprehensive survey of the Dermaptera is desirable so that an adequate comparison of this fauna can be made with the fauna of the American mainland.

The present author has had the opportunity recently to examine a large collection of Dermaptera collected on the islands of the Caribbean by Dr. P. WAGENAAR HUMMELINCK. This collection is particularly interesting since HUMMELINCK has collected on most of the smaller islands, and it is these islands which are the least known, most available records having been made on the larger islands of Cuba, Jamaica, Hispaniola, and Puerto Rico. Through the kindness of Pastor ALAYO D, a collection of Dermaptera from Cuba has also been examined, together with photographs of the specimens in the Gundlach collection which were listed by BOLIVAR (1888). These photographs have proved to be useful in checking on the species, and the correlations of the names used by BOLIVAR with modern nomenclature and the synonymy, is based on these photographs.

Additional specimens have also been examined from the United States National Museum; the California Academy of Sciences; the British Museum (Natural History); and the Manchester Museum. Miss J. DARLINGTON has also sent material of *Carcinophora percheroni* (Guérin & Percheron) from Trinidad.

A last I have had the opportunity to examine a series of Dermaptera collected in Guadeloupe, Martinique, and other French islands of the Antilles, by Dr. J. BONFILS of the Laboratoire de Zoologie, Recherches Agronomiques du Midi, Montpellier, France.

The present paper is intended to be a complete survey of the known Dermaptera of the Caribbean. All previous records known to the author are included, and keys to all families, subfamilies, genera, and species are given, together with figures of most of the species. Two new species are described.

I wish to express my sincere thanks to Dr. P. W. HUMMELINCK for the opportunity to examine the material which he has collected and so carefully recorded, and on which the present paper is so largely based. Dr. HUMMELINCKhas worked extensively on the fauna of the Caribbean, and it is to his enthusiasm that this fauna is now becoming much better known. His collection of Dermaptera clearly suggests that the Carcinophorinae form the dominant subfamily of the Caribbean islands, and that *Euborellia caraibea* is the common earwig, apparently taking the place that *Forficula auricularia* occupies in some North Temperate countries. In this connection it is notable that the closely related *Euborellia janeirensis* commonly occurs near human habitation in South America.

Dr. HUMMELINCK also provided the stimulus for the compilation of the present paper and arranged for its editing and publication: the thanks of the present author are therefore due to him for this and for other assistance in the completion of the survey.

My thanks are also due to Pastor ALAYO D for the loan of the specimens from Cuba, together with the photographs of the specimens in the Gundlach collection in Havana; to Dr. ASHLEY B. GURNEY, of the United States National Museum; to Dr. PAUL H. ARNAUD, of the California Academy of Sciences; to Dr. D. R. RAGGE, of the British Museum (Natural History); and to Miss J. DARLINGTON, now at the Nature Conservancy in Edinburgh, Scotland.

The following abbreviations are used after the data of the specimens listed to indicate their source:

Dr. P. WAGENAAR HUMMELINCK	(H)
Pastor ALAYO D	(A)
Dr. J. BONFILS	(B)
United States National Museum	(USNM)
California Academy of Sciences	(CAS)
British Museum (Natural History)	(BM)
Manchester Museum	(MM)

The figures are drawn from specimens, except for the following, which have been taken from the sources quoted: Fig. 2 (HINCKS, 1955); Fig. 3 (HINCKS, 1959); Fig. 31 (REHN, 1925); Fig. 47 (REHN & HEBARD, 1917); Fig. 48 (from photograph); Fig. 49 (BURR, 1911); Fig. 50 (BURR, 1910); Fig. 51 (REHN, 1905); Figs. 52–54 (from drawings kindly supplied by Pastor ALAYO D).

COMPOSITION OF THE FAUNA

Dermaptera are characteristically tropical or subtropical in distribution, and the order reaches its maximum richness in the equatorial forests of the world; the main requirements of the species in general appear to be warmth and humidity, and the percentage of species which are found in colder or more arid climates is small. The majority of the species of the order occur in the Oriental Region, but nearly one quarter are found in the Ethiopian Region. The fauna of the Neotropical Region appears to be as rich as that of the Ethiopian Region but that of the Nearctic Region is poor. The distribution of most species is restricted so that each Region tends to have its distinctive species, and often the distribution of species is further restricted within a Region. The main exceptions are the small number of cosmopolitan species which have a very wide World distribution.

The distribution of Dermaptera appears to be largely controlled by climatic conditions, but the present distribution of the cosmopolitan species appears to be partly due to accidental introductions into various countries by commerce. The habit of these insects in hiding by day in crevices, such as beneath the bark of trees, or in the basal leaves of plants, tends to favour such introductions, and these may lead to the establishment of the species if it is sufficiently adaptable.

Since the islands of the Caribbean have a tropical or subtropical climate, and are relatively close to the American mainland, the Dermaptera should be relatively rich. Even though the smaller islands, may be unsuitable for many species, either by reason of aridity, population pressure, or other factors, the larger islands should offer suitable habitats. These larger islands have not been sufficiently studied, and the present total of 38 species should

certainly be increased by future collecting. The composition of the known fauna is very interesting, and its relation to that of the American mainland, together with the apparent high proportion of endemic species and their relation to other known species is discussed below.

Dermaptera are mainly continental insects, and islands tend to have a poor fauna, unless the islands are large and well forested and are close to neighbouring continental areas. The Dermaptera fauna of islands falls into three groups: (1) the endemic species, (2) species common to neighbouring countries, and (3) cosmopolitan species. There may also be adventive species which are not considered to form part of the true fauna. The endemic species may represent relict forms, or they have developed from a single or successive invasions from neighbouring countries; the second group tends to be more dominant on continental islands than on oceanic islands; whilst the cosmopolitan species may be equally dominant on both oceanic and continental islands, and may supplant the endemic species.

The Dermaptera fauna of the Caribbean is well balanced, and all the Neo-tropical families of the order are represented. There are, however, five subfamilies of the Neo-tropical Dermaptera which are not represented, but of these the Esphalmeninae (Pygidicranidae) and the Parisolabiinae (Carcinophoridae) are montane, and the species are almost all restricted to high altitudes in the Andes. Of the other three subfamilies the Pygidicraninae (Pygidicranidae) is South American and extends northwards to the Guianas, whilst both the Geracinae (Labiidae) and the Ancistrogastrinae (Forficulidae) extend from South America into Central America, and may be found in the Caribbean.

The fauna, in common with that of the Neo-tropical Region as a whole, is characterized by the high proportion of species of the Labiidae, which account for half the total. Another feature is the high proportion of endemic species; these species may predominate in large isolated islands such as Madagascar, but they are not usually prominent in continental islands.

Except for *Forficula auricularia*, which is considered as an adventive, the Dermaptera of the Caribbean fall into the three groups previously mentioned: the endemic species, the American species, and the cosmopolitan species.

There are 19 endemic species, of which 13 are endemic to one island only, and 6 are endemic to the Caribbean as a whole (see distribution table). The high proportion of endemic species suggests that these have been isolated from the American mainland species for a sufficiently long time to have developed significant structural differences, and the fact that so many are apparently endemic to one island may indicate that speciation within the islands has been a considerable factor, but some of the endemic species appear to be relict. The high proportion of species found only on one island may not be entirely correct, since it may reflect our lack of knowledge of the true fauna, but it suggests that endemism is a notable feature of the fauna.

Euborellia caraibea is a successful endemic which is so closely related to the mainland species *E. ambigua* as to suggest that these have been derived from the same species, and are largely separable by their different habitats. Similarly *Vostox cabrerae* and *V. insularis* appear to be island forms derived from a species similar to the mainland *V. brunneipennis*; whilst of the two closely related species of *Marava*, *M. unidentata* is the island species whilst *M. pulchella* is the mainland species. Such endemic species as *Marava dominicae*, *M. jamaicana*, and *M. modesta* are closely related to other mainland species of the same genus.

Doru albipes is a most distinctive endemic, however, and is well separable from the other species of the genus, most of which are closely similar to each other in colour and in structure. *Cipex schwarzi* and *C. elongata* may be relict species, and are yet only known from the single type specimen of each, together with an additional male of the former species, which was taken in the same locality as the type. *Formicilabia caribea* is a genus and species endemic to the island of Hispaniola, but this species may prove to be more closely related to species of the subfamily Geracinae (Labiidae) from Central America; if not this again appears to be a relict species.

DISTRIBUTION OF DERMAPTERA ON THE CARIBBEAN ISLANDS	Bermuda	Florida Keys	Bahamas	Cuba	Jamaica	Hispaniola	Puerto Rico	St. Thomas	Tortola	St. Croix	St. Martin	St. Barthélemy	Saba	St. Eustatius	St. Kitts
DIPLATYIDAE															
1. *Cylindrogaster occidentalis*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
PYGIDICRANIDAE															
2. *Pyragropsis buscki*	—	—	—	×	×	×	—	—	—	—	—	—	—	—	—
CARCINOPHORIDAE															
3. *Carcinophora americana*	—	—	—	×	×	×	×	—	—	—	—	—	—	—	—
4. *C. percheroni*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
5. *C. nigra*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
6. *C. waddyi*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
7. *Anisolabis maritima*	—	×	×	×	—	×	×	—	—	—	×	×	—	—	—
8. *Euborellia caraibea*	—	×	×	×	×	×	×	—	—	×	×	×	×	×	—
9. *E. stali*	—	×	×	×	×	×	×	×	—	×	×	×	—	—	×
10. *E. annulipes*	—	×	×	×	×	×	—	—	—	—	—	—	—	—	—
11. *Brachylabis allardi*	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
LABIDURIDAE															
12. *Labidura riparia*	×	×	×	×	×	×	×	—	—	—	×	×	—	—	×
13. *L. xanthopus*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
LABIIDAE															
14. *Labia curvicauda*	—	—	—	×	×	×	×	—	—	—	—	—	—	—	×
15. *L. pilicornis*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
16. *L. dorsalis*	—	—	—	×	—	×	—	—	—	—	—	—	—	—	—
17. *L. arcuata*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
18. *L. annulata*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
19. *Spongiphora croceipennis*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
20. *Vostox cabrerae*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
21. *V. insularis*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
22. *Spongovostox ghilianii*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
23. *Marava arachidis*	—	—	—	×	×	—	×	—	—	—	—	×	—	—	—
24. *M. unidentata*	—	—	×	×	×	×	×	—	—	—	—	×	—	—	—
25. *M. pulchella*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
26. *M. modesta*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27. *M. dominicae*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
28. *M. jamaicana*	—	—	—	—	×	—	—	—	—	—	—	—	—	—	—
29. *M. quadrata*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
30. *Formicilabia caribea*	—	—	—	—	—	×	—	—	—	—	—	—	—	—	—
31. *Parasparatta dominicana*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32. *P. nigrina*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
FORFICULIDAE															
33. *Forficula auricularia*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
34. *Doru albipes*	—	—	—	×	—	×	×	×	×	×	—	—	—	—	—
35. *D. taeniatum*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
36. *Cipex elongata*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
37. *C. schwarzi*	—	—	—	×	—	—	—	—	—	—	—	—	—	—	—
38. *Kleter rehni*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals	1	5	6	19	10	13	9	2	1	3	4	6	1	1	

Barbuda	Antigua	Montserrat	Guadeloupe	La Désirade	Marie-Galante	Les-Saintes	Dominica	Martinique	St. Lucia	St. Vincent	Grenada	Barbados	Tobago	Trinidad	Margarita	Curaçao	Bonaire	Aruba	World distribution	
–	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	E	1.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	2.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	3.
–	–	–	×	–	–	–	×	–	–	–	×	–	–	×	–	–	–	–	A	4.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	E	5.
–	–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	–	–	–	E	6.
–	–	–	×	×	–	×	×	×	–	×	–	×	–	×	×	–	×	–	C	7.
×	×	×	×	–	×	–	×	×	–	×	–	×	×	×	–	×	–	–	E	8.
×	–	–	–	–	–	–	×	–	–	–	–	×	–	–	–	–	–	–	C	9.
–	–	–	×	–	–	×	–	–	–	–	–	–	–	×	–	–	–	×	C	10.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	11.
×	–	–	×	×	–	–	–	–	–	–	–	–	–	–	–	–	–	×	C	12.
–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	–	–	–	–	A	13.
–	–	–	×	–	×	–	×	×	×	×	×	–	–	×	–	–	–	–	C	14.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	C	15.
–	×	×	–	–	–	–	×	–	×	×	×	–	–	×	–	–	–	–	A	16.
–	–	×	–	–	–	–	–	–	–	×	×	–	–	×	–	–	–	–	A	17.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	18.
–	–	×	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	–	A	19.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	20.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	E	21.
–	–	×	–	×	–	×	–	–	–	–	–	–	–	–	–	–	–	–	A	22.
–	–	×	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	C	23.
–	–	–	–	–	–	–	–	–	–	×	×	–	–	×	–	–	–	–	E	24.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	25.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	E	26.
–	–	×	–	–	–	×	×	–	–	–	–	–	–	–	–	–	–	–	E	27.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	28.
–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	–	E	29.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	30.
–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	–	–	–	–	E	31.
–	–	–	–	–	–	–	×	–	–	–	–	–	–	–	–	–	–	–	A	32.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Adv.	33.
–	–	–	×	–	–	–	×	×	–	–	–	–	–	–	–	–	–	–	E	34.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	A	35.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	36.
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	E	37.
–	–	–	–	–	–	–	–	–	–	–	–	–	×	–	–	–	–	–	A	38.
3	1	2	13	2	3	2	12	6	2	7	6	3	3	11	1	1	1	2		

A = American E = Endemic C = Cosmopolitan Adv. = Adventive

Most of the endemic species are related to Neo-tropical species of the mainland, and only *Marava unidentata*, *Vostox cabrerae*, and *V. insularis* are related to Nearctic species.

There are eleven American species represented in the Caribbean fauna; apart from *Doru taeniata* which extends on the mainland from the Neo-tropical to the Nearctic Region, only one species, *Marava pulchella*, is Nearctic, and all the rest are Neo-tropical. The greater influence of the fauna of the Neo-tropical Region on the fauna of the Caribbean is thus shown both in the American species and in the endemic species. The much richer fauna of the Neo-tropical Region, however, should be noted. The possible spread of the American species into the Caribbean islands is apparently through the southern islands, and it may be significant that two of the new records of American species for the islands, *Spongiphora croceipennis* and *Kleter rehni*, have both been taken on the southern islands. If the spread of the American species has been through Trinidad or other islands, the apparent absence of *Carcinophora americana* on the southern islands can only be explained by its earlier extension through the islands and its subsequent extinction on the southern islands. The dryer and smaller islands to the south are much less attractive to Dermaptera than the larger and richer islands of the north, and apart from Trinidad, the richest part of the Caribbean for Dermaptera would be expected to be in the northern and larger islands where adequate habitats can be expected

There are seven cosmopolitan species represented in the Caribbean; this is a relatively high proportion and includes all the cosmopolitan species of the order with the exception of *Chelisoches morio* and *Labia minor*. If these cosmopolitan species do owe much of their present wide distribution throughout the World to introduction into various countries by human commerce, then islands which have a long history of human contacts will tend to have a greater number of cosmopolitan species represented than islands which are more isolated. This would account for the number of such species in the Caribbean, although none of the cosmopolitan species appear to be common, with the possible exception of *Euborellia stali*, and

there is little indication that the cosmopolitan species are supplanting the endemic species.

The fauna of the Caribbean islands, therefore, has the greatest affinity to that of the Neo-tropical Region; the high proportion of endemic species, if present knowledge is not misleading, reflects the high degree of speciation which has occurred in the islands, and the large number of cosmopolitan species is apparently associated with the long history of human interference with the islands. The subfamily Carcinophorinae is clearly the dominant group of earwigs, and *Euborellia caraibea* appears to be the most common and widely distributed of all the species.

Genitalia

The classification and taxonomy of the Dermaptera are based on the structure of the male genitalia, and the female genitalia have not been systematically studied. The male genitalia are usually distinctive in the more primitive families, and in some groups of the higher families; in the Forficulidae, however, the male genitalia tend to be more uniform in structure so that they are less useful in taxonomy. The fact that the male genitalia form the basis of the present classification and taxonomy, however, means that only male specimens can be adequately determined, and female specimens must be determined by their association, and external similarity, with male specimens. This reliance on the male genitalia for taxonomy is further increased by the structure of the forceps, since those of the male are often distinctive, whilst those of the females are much more similar to each other.

Although females therefore can be determined only in association with males with the present keys, isolated females can often be satisfactorily determined on external characters. These however are derived from those of the males, omitting secondary sexual characters. New species, with few exceptions, should only be based on male specimens, and preferably on a series containing both sexes. The description of new species in the past, based on single females has led to considerable confusion, and it is now difficult to

associate these females with any known males. This is the case with such Caribbean species as *Carcinophora nigra* (Caudell) and *Carcinophora waddyi* (Burr), which are both still only known from the single female types, and their true systematic position must remain in doubt until males can be associated with these species and the male genitalia examined.

The male genitalia of the Dermaptera are simple, and comparatively uniform in structure throughout the order, more so in the higher families. The genitalia, following the nomenclature of HINCKS & POPHAM (1970) consist of paired penes or a single penis from which project parameres. There are two groups:

Group 1: in the more primitive families the genitalia consist of paired penes which are fused medially, sometimes along their length or only at the bases (Figs. 2, 6, PE). From the distal end of each penis arises a paramere (Figs. 2, 6, P), and from the distal part of each penis arises a distal lobe (Figs. 2, 6, DL) in which a virga (Figs. 2, 6, V), is usually visible. The virga may not be visible (Fig. 13) but this may be due to lack of sclerotization and the virga may not be readily seen without suitable staining techniques. Sclerites or denticulated areas or lobes may be associated with the virga or distal lobe. – In the families Diplatyidae and Pygidicranidae, both distal lobes are directed backwards (Figs. 2, 3), but in the families Carcinophoridae and Labiduridae, one lobe is directed backwards and one is directed forwards at rest (Figs. 6, 7, 11, 13, 16, 17). In erection both distal lobes are directed forwards and mounted genitalia sometimes show this condition.

Group 2: in the higher families the male genitalia consist of a single penis (Figs. 21, 59, PE); this bears paired parameres on the distal edges (Figs. 21, 59, P), but in consequence of the single penis only one distal lobe is present, and this is median in position (Figs. 21, 59 DL). In the distal lobe is a virga (Figs. 21, 59, V), with which are often associated sclerites or denticulated areas, often of some complexity in the Labiidae (Fig. 21), but in the Forficulidae (Fig. 59), the virga is usually simple, short, and broadened basally to form a vesicle. When everted the distal lobe is extended well beyond

the parameres and the virga is reversed; any denticulated areas or sclerites passing into the anterior end of the distal lobe.

The sclerites or denticulated areas tend to vary in position and orientation in different mounts of the genitalia of the same species, so that variation in the detailed appearance of the genitalia does occur. The shape and size of the sclerites are constant however, and the shape of the parameres remains similar, although in some species these are weakly sclerotized and distortion sometimes occurs.

The male genitalia lie immediately beneath the penultimate sternite, which is the last free sternite, and can be seen if the free edge of the sternite is lifted. In the figures of the genitalia these are shown reversed, and the parameres are directed posteriorly in the insect. Male specimens can easily be separated from females, apart from the difference in the structure of the forceps, by the number of visible tergites, there being ten tergites visible in the males but only eight visible in the females. It has recently been found, however, that in some species of Oriental Carcinophoridae the males have only nine visible tergites whilst the females have only seven.

KEY TO FAMILIES AND SUBFAMILIES OF CARIBBEAN DERMAPTERA

1. Male genitalia with paired distal lobes (Figs. 2, 3, 6, 7, 13, 16, 17). 2
– Male genitalia with a single median distal lobe (Figs. 21, 59). . .6

2. Both distal lobes directed backwards at rest (Figs. 2, 3). . . . 3
– One distal lobe directed forwards and one directed backwards at rest (Figs. 6, 7, 13, 16, 17) 4

3. Femora with well marked longitudinal ridges; elongated and slender species (Fig. 1) . . . . . DIPLATYIDAE
– Femora without longitudinal ridges; short and broad species (Fig. 4) . . . . . PYGIDICRANIDAE (PYRAGRINAE)

4. Virga of male genitalia with a sinuous inner tube and broadened at base (Fig. 16); elytra always well developed; male forceps well separated at base, branches long, only slightly curved (Fig. 14). . . . . LABIDURIDAE (LABIDURINAE)
– Virga of male genitalia without a sinuous inner tube, and not broadened at base, sometimes not visible (Figs. 6, 7, 13, 17), or sometimes with sclerites; male forceps with branches closer together at base and more strongly curved usually, at least at apices (Figs. 5, 8, 9, 10, 18) 5

5. First antennal segment longer than distance between the antennae bases; abdomen fusiform; forceps of both sexes cylindrical throughout (Fig. 18) . . CARCINOPHORIDAE (BRACHYLABIINAE)
– First antennal segment shorter than the distance between the antennal bases; abdomen depressed, not fusiform; forceps of both sexes trigonal at base, cylindrical distally (Figs. 5, 8, 9, 10) . . . . . CARCINOPHORIDAE (CARCINOPHORINAE)

6. Second tarsal segment simple; virga of male genitalia often long and usually associated with sclerotized areas of some complexity (Fig. 21) (Labiidae). 7
– Second tarsal segment flattened and broadened, more or less bilobed or cordiform in shape; virga of male genitalia usually simple, sometimes broadened at base forming a vesicle, but not usually associated with sclerites of large size (Fig. 59) (Forficulidae) 9

7. Body flattened; pronotum narrowed anteriorly and with a prominent neck (Fig. 42); male and female forceps with branches straight, well separated at base, and a prominent pygidium usually present (Figs. 42, 45, 46). . LABIIDAE (SPARATTINAE)
– Body normally convex; pronotum not so narrowed anteriorly (Fig. 20); male and female forceps with branches of variable shape. 8

8. Third antennal segment as long as or longer than fifth; elytra always glabrous and usually not punctured; eyes variable in

size, often large (Figs. 29, 37, 38). LABIIDAE (SPONGIPHORINAE)
– Third antennal segment shorter than fifth; elytra usually punctured and pubescent; eyes small (Fig. 20). . . . . LABIIDAE (LABIINAE)

9. First antennal segment short, as long as or shorter than the distance between the antennal bases, and much broader distally; distal segments short and broad; legs relatively broad and short (Fig. 58) . . . . . FORFICULIDAE (FORFICULINAE)
– First antennal segment long, longer than the distance between the antennal bases, and not much broader distally; distal segments long and slender; legs relatively long and slender (Figs. 61) . . . . . FORFICULIDAE (OPISTHOCOSMIINAE)

Of the other five subfamilies of the Neo-tropical and Nearctic Dermaptera, the Pygidicraninae (Pygidicranidae); the Esphalmeninae (Pygidicranidae); and the Parisolabiinae (Carcinophoridae) are entirely South American in distribution, and only the first named subfamily extends as far north as the Guianas. The other two subfamilies are the Geracinae (Labiidae) and the Ancistrogastrinae (Forficulidae), both of which extend into Central America. The Geracinae, a subfamily erected by BRINDLE (1971b), is distinct from all other subfamilies of the Labiidae by the presence of tarsal arolia, by the very small size, and by the similarity of the forceps in both sexes. The Ancistrogastrinae agrees with the Opisthocosmiinae in having the first antennal segment long but is distinct by the usually broad depressed abdomen which often bears lateral processes in the male, or by the male forceps having dorsal or inner teeth on the branches.

DIPLATYIDAE

A relatively small family, mainly Old World in distribution, and represented in the Neo-tropical Region by six species of the genus *Cylindrogaster* and three species of the genus *Diplatys*. Only one species is recorded from the Caribbean.

1. Cylindrogaster occidentalis (Burr)

Diplatys occidentalis BURR, 1904, Trans. ent. Soc. Lond. *1904*: 278 (Grenada).
Cylindrogaster occidentalis (Burr); HINCKS, 1955, Syst. mon. Derm. *1*: 25.

A slender yellowish-brown species, front and sides of head and base and sides of elytra dark brown; legs yellowish, apices of femora and bases of tibiae dark brown. Head relatively broad, with a longitudinal ridge extending from the posterior margin of eye to posterior margin of head on each side; eyes as long as length of head behind eyes; pronotum quadrate, sides parallel; elytra and wings normally developed; abdomen long and slender; forceps with each branch slender, short, straight, and tapering distally, branches almost contiguous.

Distribution: Grenada (endemic).

This species is only known from the damaged type specimen which has lost the abdomen, together with a damaged nymph which is probably this species (HINCKS, 1955). The total length of the species is possibly about 15 mm; it should be recognizable by the colouration and by the slender build, similar to that of *Cylindrogaster sahlbergi* Dohrn (Fig. 1). The parameres of the male genitalia of this genus are short and broad (Fig. 2).

PYGIDICRANIDAE

A rather varied family in external appearance, and with well-defined subfamilies. Of the seven subfamilies, three are represented in the Neo-tropical Region, but only one is known from the Caribbean, and this is represented by a single species.

PYRAGRINAE

2. **Pyragropsis buscki** (Caudell)

Pyragra buscki CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 166 (Cuba).
Pyragra buscki Caudell; BURR, 1910, Proc. U.S. natn Mus. *38*: 445 (Cuba; Jamaica).
Pyragropsis buscki (Caudell); REHN & HEBARD, 1917, Bull. Amer. nat. Hist. *37*: 636 (Cuba).
Pyragropsis buscki (Caudell); MENOZZI, Boll. Lab. agr. zool. Portici *25*: 322 (Dominican Republic).
Pyragropsis buscki (Caudell); HINCKS, 1959, Syst. mon. Derm. *2*: 189 (Jamaica).

A short broad reddish-brown species, pronotum with front and sides paler, and each elytron usually with a pale basal spot, wings sometimes paler at base. Pronotum more or less quadrate, elytra normally developed, wings rather short; abdomen broad, depressed, tergites 6–8 of male each with a well marked longitudinal ridge on each lateral surface, last tergite with a weak longitudinal ridge towards each side; forceps simple, branches well separated at base, each branch trigonal at base, cylindrical and curved distally, inner margin dentated for basal half (Fig. 4). Genitalia of male with curved parameres (Fig. 3).

Length: body 10–11 mm, forceps 2–2.5 mm.

Distribution: Cuba; Jamaica; Hispaniola. – Endemic to these three islands of the Caribbean.

CARCINOPHORIDAE

A large family, the species of which are usually dark coloured, apterous earwigs, varying in size from very small species to some of the largest known species of the order. There are four subfamilies of very unequal size, the largest of which, the Carcinophorinae, is represented in the Caribbean, together with one species of the second largest subfamily, the Brachylabiinae.

CARCINOPHORINAE

Although most species of this subfamily are entirely without elytra or wings, there is one Neotropical genus, *Carcinophora* Scudder, in which elytra are always present and wings are usually visible. Eight species in three genera are recorded from the Caribbean, but two of these species are based on single females. Since all main taxonomic characters, both of the genitalia and external structure, are those of males, these species are inadequately known. In the limited fauna of the Caribbean, however, the external characters as used in the key should be sufficient, providing that the species do really belong to the genus *Carcinophora*. Species of this genus may superficially resemble some species of the family Labiidae, and since the only certain distinctions between this family and the Carcinophoridae lie in the structure of the male genitalia, isolated females, especially of small size, may be difficult or impossible to place correctly. In the key below it has been assumed that these two species, known from females, do belong to the genus *Carcinophora*.

KEY TO CARIBBEAN GENERA AND SPECIES OF CARCINOPHORINAE

1. Virga of male genitalia not visible, parameres short and broad, each distal lobe with denticulated pads (Figs. 11, 13). (*Euborellia*) 2
– Virga of male genitalia visible, parameres long, and distal lobes without denticulated pads (Figs. 6, 7). 4

2. Elytra and wings completely absent . . . . . *Euborellia annulipes* (Lucas)
– Elytra present, even though rudimentary; wings absent. . . 3

3. Elytra represented by small lateral flaps on the mesonotum (Fig. 12) . . . . . *Euborellia stali* (Dohrn)
– Elytra larger, meeting or overlapping along sutures (Fig. 9) . . . . . *Euborellia caraibea* Hebard

4. Elytra and wings completely absent (Fig. 5); parameres of male genitalia narrowed towards tip, virga slender, not indurated (Fig. 6) . . . . . *Anisolabis maritima* (Bonelli)
– At least elytra present and meeting along sutures, wings often present (Fig. 8); parameres of male genitalia not narrowed towards tip, tip usually pointed, virga wider, indurated (Fig. 7) (*Carcinophora*) 5

5. Wings absent or concealed; small black species, body length 7.4 mm . . . . . *Carcinophora waddyi* Burr
– Wings present and visible. 6

6. Elytra unicolorous black; smaller, body length below 10 mm. . . . . *Carcinophora nigra* (Caudell)
– Elytra not usually unicolorous, each elytron with a yellow spot or yellow band, sometimes the latter is obscured; larger, body length over 12 mm. 7

7. Head usually reddish; each elytron with an anterior small yellow spot; wings broadly yellow at base; body length less than 20 mm. . . . . *Carcinophora percheroni* (Guérin & Percheron)
– Head blackish; each elytron with a broad transverse yellow or reddish-yellow band; sometimes the band is obscured; wings dark (Fig. 8); body length 20 mm or more . . . . . *Carcinophora americana* (Beauvois)

3. **Carcinophora americana** (Beauvois)

Forficula americana Beauvois, 1817, Ins. rec. Afr. Amer., Orth.: 165 (Haiti).
F. distincta Guérin & Ménéville in Ramón, 1856, Hist. Ins. Cuba *7*: 136 (Cuba).
F. procera Burmeister, 1838, Handb. Ent. *2*: 753 (West Indies).
Forficesila americana (Beauvois); Serville, 1839, Hist. nat. Orth.: 22 (Dominican Republic).
Psalis americana (Beauvois); Bolivar, 1888, Mem. Soc. zool. France *1*: 4 (Cuba).
P. americana (Beauvois); Caudell, 1907, Jl. N.Y. ent. Soc. *15*: 167 (Dominican Republic).
P. americana (Beauvois); Burr, 1908, Bull. Mus. natn Hist. nat. Paris *1908*: 29 (Dominican Republic; Cuba).

P. americana (Beauvois); BURR, 1910, Proc. U.S. natn Mus. *38*: 446 (Dominican Republic; Cuba).
P. americana (Beauvois); BURR, 1912, Annln naturh. Mus. Wien *26*: 29 (Dominican Republic; Cuba).
P. americana (Beauvois); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 167 (Dominican Republic; Cuba; Jamaica).
P. americana (Beauvois); HEBARD, 1920, Proc. Acad. nat. Sci. Philad. *1920*: 338 (Haiti; Cuba).
P. americana (Beauvois); REHN, 1925, Trans. Am. ent. Soc. *51*: 19 (Jamaica).
P. americana (Beauvois); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 323 (Dominican Republic).
Carcinophora americana (Beauvois); BRINDLE, 1967, Ent. Mitt. zool. Staatsinst zool. Hamburg *3*: 12 (Hamburg, introduced in timber from Cuba).
Forficula gagatina BURMEISTER, 1838, Handb. Ent. *2*: 753 (Puerto Rico).
Apterygida buscki REHN, 1903, Trans. Am. ent. Soc. *29*: 129 (Puerto Rico).
Sphingolabis buscki (Rehn); CAUDELL, 1907, Jl. N.Y. ent. Soc. (Dominican Republic).
Psalis gagatina (Burmeister); BURR, 1910, Proc. U.S. natn Mus. *38*: 446 (Dominican Republic; Puerto Rico).

A large and robust species (Fig. 8), usually dark brown or blackish; antennae brown, basal segments yellow; each elytron with a large broad transverse yellow or orange band, or with this patch obscured; wings dark; legs yellow or with femora darkened, sometimes the whole legs are generally dark. Specimens from Cuba and Jamaica usually have the yellow band well defined and conspicuous, whilst those from the Dominican Republic often have the band obscured. Specimens with almost entirely blackish elytra occur in the Dominican Republic and in Puerto Rico, and these are referable to *gagatina* (= *buscki*).

Head broad and tumid; eyes small; pronotum relatively small, as broad as long, posterior margin strongly convex; elytra and wings fully developed or wings rather short; abdomen broad and depressed; forceps of male relatively long, branches slender and asymmetrical; those of female shorter, branches broader and more contiguous. Genitalia with long parameres, virga indurated (Fig. 7).

Length: body 20–38 mm, forceps 4–6 mm.

CUBA: La Juanita, Cienfuegos, IV. 1967, 1 ♀; Cueva del Agua, El Mogota, Sagua la Grande, II. 1966, 1 nymph (A).

Distribution: Restricted to the larger islands of Cuba, Jamaica, Hispaniola and Puerto Rico in the Caribbean. – Neotropical in World distribution, and recorded on the mainland of America from Guatemala, Nicaragua, Costa Rica, Panama, Ecuador, Venezuela, Colombia, and Peru.

The older generic name of *Psalis* Serville, 1831, is pre-occupied by *Psalis* Huebner, 1823 (Lepidoptera) and *Carcinophora* Scudder, 1876 is the correct generic name. Due to some variability of the colouration of *americana*, some synonymy is involved, especially the names applied to the blackish specimens from Dominican Republic and Puerto Rico. REHN & HEBARD (1917) also included the names *robusta* Scudder and *colombiana* Bormans, as synonyms of *americana*, but these names represent a distinct South and Central American species in which the elytra are short and the wings absent. BRINDLE (1967) considered *gagatina* and *buscki* as synonyms representing a distinct species to *americana*, but further study has suggested that these names refer to the blackish form of *americana*.

The population of *americana* on the larger islands of the Caribbean is thus entirely separated from the population on the mainland of America, but there appear to be no external differences between specimens from both areas. However there are certain differences in the male genitalia examined, but it is not certain that these are constant, and this is to be studied further. It is possible that the Caribbean specimens (the true *americana*) may prove to be specifically distinct from the mainland specimens.

4. **Carcinophora percheroni** (Guérin & Percheron)

Forficula percheroni GUÉRIN & PERCHERON, 1838, Gen. Ins. *6*: 4 (French Guiana).
F. elegans Klug in BURMEISTER, 1838, Handb. Ent. *2*: 753 (West Indies).
Psalis pulchra REHN, 1903, Proc. Acad. nat. Sci. Philad. *1903*: 303 (Costa Rica).
Labia pictipennis BRUNER, 1906, Jl. N.Y. ent. Soc. *14*: 138 (Trinidad).
Psalis pulchra Rehn; CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 167 (Trinidad).
P. pulchra Rehn; BURR, 1910, Proc. U.S. natn Mus. *38*: 446 (Trinidad).
P. pulchra Rehn; BURR, 1912, Annln naturh. Mus. Wien *26*: 73 (Grenada).
Spandex percheron (Guérin & Percheron); HEBARD, 1917, Proc. Acad. nat. Sci. Philad. *1917*: 232 (Trinidad – type of *Labia pictipennis* Bruner).
Carcinophora percheron (Guérin & Percheron); BRINDLE, 1971, Smiths. Contr. Zool. 63:10 (Dominica).

A distinctive and colourful species; shining black, head usually reddish, occasionally darker; antennae brown to dark brown, basal segments yellow, and with one or more distal segments white; pronotum with yellow lateral margins, or sometimes partly or

entirely reddish-yellow; elytra black with an anterior yellow spot, and wings black, broadly yellow at base; legs yellow.

Structurally similar to *americana* but smaller in size; male genitalia similar to those of *americana* but parameres more acuminate distally.

Length: body 13–18 mm, forceps 2–3 mm.

GUADELOUPE: Forêt de Matouba, 900 m, 13.XI.1961, 1 ♀; Savana-à-Mulets, 1000 m, 17.I.1965, 1 ♂, 1 ♀; Palmiste, 500 m, 23.IV.1964, 1 ♀; Moscou, 700 m, 16 & 22.XI.1962, 25.IV.1963, 4 ♀; Grand-Étang, 400 m, 16.XI.1962, 1 ♀; Duclos, 250 m, VI.1960, 1 ♀; Riv. Corossol, 300 m, forêt, 12.VIII.1962, 1 ♂, 1 larve; Les Mamelles, 500 m, 7.VIII.1967, 1 ♂, 1 ♀ (B).
GRENADA: near Grand Etang, forest, 500 m, Sta. 590, 24.I.1955, 1 ♀ (H); Grand Etang, 1900 ft. (Smith) (MM).
TRINIDAD: Tamana Cave, 21.I.1966, 4.III.1966, common in various stages (D) (MM); Caparo, VI.1913, 1 ♀ (MM); Trinidad, 3 ♀ (BM).

Distribution: Brazil, French Guiana, Guyana, Panama, Costa Rica, Trinidad' Grenada and Dominica; now Guadeloupe.

This is a very distinctive species, which is colourful and merits the specific names of *elegans* or *pulchra*, formerly applied to the species.

5. **Carcinophora nigra** (Caudell)

Psalis nigra CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 167 (Trinidad).
P. nigra Caudell; BURR, 1910, Proc. U.S. natn Mus. *38*: 447 (Trinidad – Montserrat in error – type specimen).

Black; antennal segments dark brown, segments 13–14 or 12–14 yellow; wings brown, with central part slightly yellowish; legs light brown, faintly marked longitudinally with darker brown. Pronotum quadrate, posterior margin convex, elytra and wings normally developed.

Length: body 9.5 mm, forceps 2 mm.

Distribution: Trinidad.

Apparently only known from the female type; it is an unsatisfactory species, since it is difficult to associate any possible males. A thorough re-examination of the type is desirable.

6. Carcinophora waddyi Burr

Psalis waddyi Burr, 1904, Trans. ent. Soc. Lond. *1904*: 290 (Martinique).

A small dark brown species; head black; antennae dark brown, segments 1–3 pale; pronotum black, lateral margins yellow. Elytra rather short, wings absent or concealed; legs yellow, femora and tibiae annulated with brown; abdomen yellowish-brown; forceps with branches contiguous.

Length: body 7.4 mm, forceps 1.3 mm.

Distribution: Martinique.

Only known from the female type; it is an unsatisfactory species.

7. Anisolabis maritima (Bonelli)

Forficula maritima Bonelli in Gene, 1832, Monogr. Forficul.: *9* (Mediterranean).
Anisolabis maritima (Bonelli); Bormans, 1880, Comp. Red. Soc. ent. Belge *1880*: 3 (St. Barthélemy; Guadeloupe).
Anisolabis maritima (Bonelli); Caudell, 1907, Jl. N.Y. ent. Soc. *15*: 168 (Bahamas).
Anisolabis maritima (Bonelli); Burr, 1910, Proc. U.S. natn Mus. *38*: 448 (Dominican Republic; Puerto Rico).
Anisolabis maritima (Bonelli); Burr, 1912, Annln naturh. Mus. Wien *26*: 97 (Haiti; St. Vincent).
Anisolabis maritima (Bonelli); Rehn & Hebard, 1917, Bull. Amer. Mus. nat. Hist. *37*: 638 (Bahamas; Cuba; Puerto Rico; Barbados; Dominica).

Shining black or dark brown, lighter in colour when immature, and sometimes uniformly reddish-brown; antennae brown or dark brown, sometimes yellow basally; legs yellow or yellowish-brown, unicolorous.

Head broad, eyes small; pronotum large, widened posteriorly; elytra and wings completely absent; abdomen wide and depressed. Male forceps with branches strongly curved, trigonal at base, cylindrical distally, asymmetrical (Fig. 5); those of female with branches slender, more or less straight, and symmetrical. Male genitalia with each paramere long, almost parallel-sided, but narrowed near apex; virga long and slender (Fig. 6).

Length: body 16–18 mm, forceps 2.5–3.5 mm.

FLORIDA: *Virginia Key*, Marine Laboratory, decaying material of Casuarina and Sesuvium on beach, Sta. 689, 4.IX.1963, 1 ♂, 3 ♀; *Key Biscayne*, North Point beach, amongst decaying Thalassia, Sta. 690, 7.IX.1963, 1 ♂, 1 ♀ (H).
BAHAMAS: *North Bimini*, Alice Town, amongst decaying Thalassia, Sta. 496, 18.VIII 1949, 1 ♀ (H).
CUBA: Cayo Largo, IV.1967, 1 ♂, 2 ♀; litoral, Norte Habana, 2 ♀ (A).
ST. MARTIN: Great Saltpond, under rocks on mud, Sta. 463, 25.V.1949, 5 ♂, 2 ♀; Simpson Bay, shore of former lagoon, now salt-lake, Sta. 1130B, 16.X.1963, 1 ♀; Point Blanche, near shore, Sta. 459, 17.V.1949, 1 nymph (H); Baie Nettlé, III.1963, 1 ♂, 1 ♀; 10.VI.1966, 3 ♂, 3 ♀ (B).
ST. BARTHÉLEMY: Gustavia harbour, amongst flotsam, Sta. 450, 1.VI.1949, 1 ♀ (H).
GUADELOUPE: Gros-Cap, 1.XII.1964, beach debris, 8 ♂, 2 ♀; Anse-à-l'Eau, 4.III. 1966, 1 ♂, 3 ♀; Anse-à la-Barque, 12.V.1965, 1 ♀ (B).
LA DÉSIRADE: Grande-Anse, 1967, wet beach debris, 1 ♂, 1 ♀ (B).
LES SAINTES: *Terre-de-Haut*, Vieille Anse, 10.III.1965, 8 ♂, 8 ♀ (B).
MARTINIQUE: Vauclin, beach, 17.XII.1965, 7 spec.; Le Lorrain, shore, 18.XII.1965, 1 sp. (B).
BARBADOS: Conset Bay, debris near shore, Sta. 864, 6.VII.1967, 1 ♀ (H).
TRINIDAD: *Chacachacare*, debris on beach, Sta. 579, 11.I.1955, 1 ♀, 1 ♂ (H).
MARGARITA: Punta Mosquito, sandy shore debris, Sta. 797, 13.I.1964, 2 ♀, 1 nymph (H).
BONAIRE: Kralendijk, 20.IX.1948, 1 ♀ (H).

Distribution: Widely distributed but apparently not common on the Caribbean islands, and mainly on sandy beaches. – Cosmopolitan in World distribution, but typical maritime in habitat; it usually occurs on sea coasts.

8. **Euborellia caraibea** Hebard

Anisolabis azteca BOLIVAR, 1888 (not Dohrn, 1862), Mem. Soc. zool. France *1*: 4 (Cuba).
Anisolabis janeirensis CAUDELL, 1907 (not Dohrn, 1864), Jl. N.Y. ent. Soc. *15*: 168 (Puerto Rico).
Borellia janeirensis BURR, 1910 (not Dohrn, 1864), Proc. U.S. natn Mus. *38*: 448 (Jamaica; Puerto Rico).
Euborellia ambigua HEBARD, 1917 (not Borelli, 1906), Proc. Acad. nat. Sci. Philad. *1917*: 234 (Trinidad).
Euborellia ambigua (Borelli); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 638 (partim) (Bahamas; Cuba; Jamaica; Puerto Rico; ? St. Vincent; Dominica).
Euborellia caraibea HEBARD, 1922, Trans. Am. ent. Soc. *47*: 322 (above localities together with Haiti and Trinidad).
Euborellia janeirensis MENOZZI, 1931 (not Dohrn, 1864) Boll. Lab. agr. zool. Portici *25*: 322 (Dominican Republic).

A dark reddish-brown to blackish-brown species, shining; antennae brown to dark brown, pronotum yellow on lateral margins; legs yellow or with femora darkened.

Head broad, eyes rather large; pronotum quadrate, posterior margin weakly convex; elytra short, only covering mesonotum, meeting or overlapping medially; wings absent. Abdomen broad, depressed, rather strongly punctured, penultimate sternite of male triangular but with posterior margin concave; forceps short, branches trigonal at base, cylindrical distally, strongly curved at apices in male (Fig. 9); more widely separated at base than in female, in which the branches are almost contiguous (Fig. 10). Abdominal tergites of male rugose at sides and tergites 6–9 with a lateral longitudinal ridge at each side. Parameres of male genitalia with a pronounced external angle (Fig. 11).

Length: body 8–9 mm, forceps 1.5 mm.

FLORIDA: *Virginia Key*, near Marine Laboratory; casuarina trees with Avicennia and palms, Sta. 688, 7.IX.1963, 6 ♀ (H).
CUBA: Est. Exp. Agronomica, Habana, 21.VII.1961, 1 ♂; Mogote, Taravela La Palma, P. Rio, 14.III.1948, 1 ♀; El Cano, 7.X.1931, 1 ♀; Stgo de las Vegas, 21.II. 1936, 1 ♀; Cuabitas, Stgo de Cuba, IV.1954, 3 ♀; Habana, VII.1957 1 ♀ (A).
PUERTO RICO: Mayagüez, Las Mesas, 300 m, Mangifera decay on clayish soil, Sta. 695, 20.IX.1963, 3 ♀ (H).
ST. CROIX: Upper Bethlehem, agric. exp. Sta., limestone debris with plant decay, Sta. 613, 13.VI.1955, 1 ♂, 4 ♀ (H).
ST. MARTIN: Colombier Valley, leaf decay, Sta. 466, 20.V.1949, 1 ♀, 1 nymph (H).
ST. BARTHÉLEMY: Public, leaf decay, Sta. 451, 4.VI.1949, 2 ♀ (H).
SABA: Behind the Mountain, tree fern bush, 800 m, Sta. 440, 26.VII.1949, 1 ♀; road to Bottom, 19.VII.1949, 1 ♂, 1 ♀; Booby Hill, semi-cultivated area, 470 m, 25.VII. 1949, 1 ♀; Kate's Hill, bush, 500 m, Sta. 441, 25.VII.1949, 1 ♂ (H).
ST. EUSTATIUS: White Wall, at base, shrubs, Sta. 424, 6.VII.1949, 1 ♀; Glass Bottle, Quill, leaf decay, Sta. 430, 12.VII.1949, 1 ♀; Quill, 400 m, leaf decay, Sta. 429, 12.VII.1949, 1 ♂, 1 ♀ (H).
ANTIGUA: Yepton Mill, cultivated soil, grassy, Sta. 595, 17.VII.1955, 1 ♀ (H).
MONTSERRAT: Foxes Bay, N. W. Plymouth, scanty cocos decay at beach, Sta. 836, 20.VII.1967, 1 ♀, 5 nymphs (H).
GUADELOUPE: Duclos, 250 m, III.1963, 1 ♀; Sainte-Rose, swamp at Cluny, 18.VIII. 1963, 2 ♂, 3 ♀; Gros-Cap, 10.XII.1965, 3 sp. (B); Pigeon, V-VI.1952, 1 ♀ (L. Berland, Museum Paris).
MARIE-GALANTE: Capesterre, debris on sandy beach, Sta. 744, 2.II.1964, 1 ♂, 1 ♀, 2 nymphs (H).
MARTINIQUE: Trois Rivières, palm grove near shore, Sta. 848, 12.VII.1967, 5 nymphs (H); Malakoff, 400 m, 30.VII.1965, cult., 1 ♀; Le Lorrain, 18.XII.1965, 2 sp.; Rivière-Pilote, sugar cane, 15.XI.1956, 1 sp. (R. Benard) (B).
ST. VINCENT: Calliqua Bay, Johnson Pt., decaying plant material at shore, Sta. 855, 10.VII.1967, 1 ♂, 1 ♀; Diamond, St. George, bananas, etc., Sta. 854, 10.VII.1967, 2 ♀, 2 nymphs (H).

BARBADOS: Porter's Gully, Holetown, decaying plant material on limestone, Sta. 777, 15.II.1964, 1 ♂ (H).
TOBAGO: near Store Bay, in scanty debris, semicultivated field near shore, Sta. 581, 17.I.1955, 1 ♂, 1 ♀, 4 nymphs (H).
TRINIDAD: Bamboo Grove, near Port-of-Spain, in mosses, 29.I.1955, 1 ♀ (H).
CURAÇAO: Carmabi (Marine Biological Station), at light, 24.X.1963, 1 ♀ (H).

Distribution: On almost all the Caribbean islands and practically endemic.

This species is mainly distinct from *Euborellia ambigua* (Borelli) by the rather larger eyes and by the better development of the lateral longitudinal ridges on the distal abdominal tergites of the male. These differences appear to be subject to some variation however in the specimens examined, and there is little obvious difference between the male genitalia of *ambigua* and *caraibea*. *E. ambigua* however appears to be restricted to mangrove swamps and is recorded from Costa Rica and Florida in such habitats. The present females from Virginia Key, Florida appear to be identical with other females of *caraibea* from the Caribbean islands, and are recorded as such above. Until more material of *ambigua* is available it seems best to regard this species as distinct from *caraibea*, the former being restricted to mangrove swamps on the American mainland, whilst the latter is the island species, otherwise only occurring on sandy areas on Virginia Key.

Euborellia janeirensis (Dohrn) only occurs in South America, and all records of this species from the Caribbean refer to *E. caraibea*.

9. **Euborellia stali** (Dohrn)

Forcinella stali DOHRN, 1864, Stettin. ent. Ztg. *25*: 286 (Java).
Anisolabis minuta CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 168 (Puerto Rico).
Euborellia minuta (Caudell); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 639 (Bahamas; Cuba; Jamaica; Puerto Rico; Barbados).
Euborellia minuta (Caudell); HEBARD, 1920, Proc. Acad. nat. Sci. Philad. *1920*: 338 (Cuba)
Euborellia stali (Dohrn); REHN, 1925, Trans. Am. ent. Soc. *51*: 20 (Jamaica).
Euborellia minuta (Caudell); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 322 (Dominican Republic).
Euborellia stali (Dohrn); BRINDLE, 1971, Smiths. Contr. Zool. *63*:9 (Dominica).

Shining black or dark reddish- brown; antennae brown, basal segments yellow, and two or more distal segments white; lateral margin of pronotum yellow; legs yellow, femora banded with dark brown or black.

Head broad, eyes small, pronotum as broad as long or nearly so, widened posteriorly; elytra represented by elliptical lateral flaps firmly attached to each side of the mesonotum (Fig. 12); abdomen widened medially, depressed, closely punctured, tergites 7–9 with sides rugose and with a lateral longitudinal ridge on each side. Forceps short, branches trigonal at base, cylindrical distally, those of male more widely separated at base than those of the female, and more curved; those of the female with branches more or less contiguous and straight. Parameres of male genitalia with external margin rounded (Fig. 13).

Length: body 7–9 mm, forceps 1–1.5 mm (males), 1 mm (females).

FLORIDA: *Virginia Key*, beach near Marine Laboratory, in decaying material of Casuarina and Sesuvium, Sta. 688, 4.IX.1963, 3 ♀, 6 nymphs (H).
CUBA: Stgo de las Vegas, 2.VIII.1937, 1 ♀; Casilda Trinidad, L.V., 1 ♀; Cuabitas, Stgo de Cuba, IV.1954, 1 ♀ (A).
ST. THOMAS: Brookman River, leaves of Annona etc., Sta. 622, 17.VI.1955, 1 ♀ (H).
ST. CROIX: Upper Bethlehem, E. hill slope, 14.VI.1955, Sta. 612, 1 ♀; Fredensborg, semicultivated land, with shrubs on marl, 11.VI.1955, 1 ♀; N. of Airport, semicultivated land with scanty shrubs on marl, 11.VI.1955, 1 ♀ (H).
ST. MARTIN: near Philipsburg, 21.V.1949, 1 ♀; Cul de Sac, St. Peter, cultivated land, Sta. 468, 24.V.1949, 2 ♀; Doctor's Well, pasture with rocks, Sta. 538b, 16.X.1963, 1 ♀ (H); Grand-Case, 30.III.1963, 2 ♂ (B); Baie Nettlé, 10.VI.1966, 9 sp. (B).
ST. BARTHÉLEMY: Lorient, poor pasture, Sta. 448, 3.VI.1949, 1 ♂, 1 ♀ (H); Lorient, beach debris, III.1963, 17 sp.; 15.XI.1963, 1 ♂, 1 ♀ (B).
ST. KITTS: La Guérite, Agr. exp. Sta., heap of debris, Sta. 119, 2.VII.1949, 2 ♂, 3 ♀, 2 nymphs (H); St. Kitts, under stones, 1 ♂ (BM).
BARBUDA: Codrington Village, N.W. plain, among rocks, Sta. 603, 5.VII.1955 3 ♂, 6 ♀ (H).
GUADELOUPE: Matouba, Riv. Rouge, 1000 m, 12.I.1966, 1 sp.; Grande-Rivière, 20 m, 30.VIII.1960, 1 sp. (B); Pigeon, V–VI.1952, 1 ♀ (L. Berland, Mus. Paris); Sainte-Marie, IV.1964, 1 ♂; Sainte-Rose, swamp at Cluny, 28.VIII. 1963, 1 ♂; Gros-Cap, 10.XII.1965, 4 sp. (B).
MARIE-GALANTE: Saint-Louis, Pt. Cimetierre, 15.I.1966, 1 ♀ (B).
LES-SAINTES: *Terre-du-Haut*, III.1965, 1 ♂ (B).
MARTINIQUE: Le Lorrain, sandy shore, 18.XII.1965, 1 sp. (B).
BARBADOS: Cole's pasture (St. Philip) near pond, semicultivated, 6.VII.1967, 2 ♀ (H).

Distribution: On many of the Caribbean islands but less common and not so widely distributed as *caraibea*. – Cosmopolitan in World distribution, and almost circumtropical, but mainly Oriental and Neotropical in distribution.

10. **Euborellia annulipes** (Lucas)

Forficesila annulipes LUCAS, 1847, Ann. Soc. ent. France (*2*) *5*: 84 (Paris, introduced).
Forcinella antoni DOHRN, 1864, Stettin. ent. Ztg. *25*: 289 (Venezuela).
Anisolabis bormansi SCUDDER, 1893, Bull. Mus. Harvard *25*: 5 (Galápagos Islands).
Anisolabis annulipes (Lucas) (Serville in error); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 168 (Cuba).
Anisolabis antoni (Dohrn); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 168 (Trinidad).
Anisolabis annulipes (Lucas); BURR, 1910, Proc. U.S. natn Mus. *38*: 447 (Cuba; Guadeloupe; Trinidad).
Euborellia annulipes (Lucas); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 640 (Bahamas; Jamaica).
Euborellia annulipes (Lucas); REHN, 1925, Trans. Am. ent. Soc. *51*: 19 (Jamaica).
Anisolabis annulipes (Lucas); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 322 (Dominican Republic).

Shining black or dark brown species; antennae brown, one or more distal segments white; legs yellow, each femur with a dark brown or blackish ring, but this ring may be faint sometimes.

Head broad, eyes small; pronotum rather longer than broad, widened posteriorly; elytra and wings completely absent; abdomen wider medially, depressed, finely punctured, tergites 7–9 with sides rugose but only tergites 7–8 with a lateral longitudinal ridge on each side. Forceps short, each branch trigonal at base, cylindrical distally, those of male more strongly curved than those of the female, the latter having the branches contiguous and almost straight. Parameres of male genitalia with external margin rounded or with a slight external angle.

Length: body 9–11 mm, forceps 1–1.5 mm.

CUBA: S. Miguel de los Banos, VII.1966, 1 ♂, 1 ♀, 1 nymph; Stgo de las Vegas, Habana, III.1968, 1 ♀, 1 nymph; Playa de Baracoa, Bauta, Habana, XI.1952, 1 ♂; Stgo de las Vegas, Habana, 1.IX.1932, 1 ♂, 1 ♀; Marianao, Habana, XII.1965, 1 ♀; Pico Cardero, Torquino, VI.1963, 1 ♀; Sierra del Rosario, Pinar del Rio, III.1968, 1 ♀ (A).
BARBUDA: Codrington Village, cattle pond, Sta. 674, 5.VII.1955, 1 ♂ (H).
LES SAINTES: *Terre-de-Haut*, pond, Sta. 759, 6.II.1964, 1 ♂, 3 nymphs (H).
TRINIDAD: Tamana quarry, 130 m, amongst limestone debris, Sta. 568, 9.I.1955, 1 nymph (H).
ARUBA: Savaneta, garden, 1.V.1955, 1 ♀ (H).

Distribution: Apparently mainly on the larger northern islands, but occurs sporadically on the southern islands. – Cosmopolitan in World distribution, although in tropical or semi-tropical climates; probably the most widely distributed species of the order and one which occurs on many isolated oceanic islands.

The species is not adequately defined, and more than one species may be represented in the present concept of this species. All the specimens from the Caribbean islands are conspecific.

BRACHYLABIINAE

This is the second largest subfamily of the Carcinophoridae, but much less numerous in species than the Carcinophorinae. The subfamily is not well known since the species are not commonly collected possibly due to their habitats which seem to be generally in forest litter and similar places. Some recently described species are very small, and more species of this subfamily are certainly to be found in the future. Generally distinctive by the long first antennal segment, the absence of elytra and wings in almost all species, and the short cylindrical forceps which are not greatly dissimilar in the sexes, those of the male usually being more curved than those of the female.

The nomenclature of the subfamily is confused, and the present genera are poorly defined. Pending a revision of the subfamily it has been the practice of the present author to describe all new species of the subfamily under the genus *Brachylabis* Dohrn. Although this genus gives its name to the subfamily, the genus itself is poorly defined, since the type species, *chilensis* Blanchard, which was given as type species by BURR (1911) is only known from the original description and figure, although subsequent authors have recognized it more or less satisfactorily. There is, however, considerable doubt about details of the structure of *Brachylabis chilensis*.

Few Neo-tropical species of the subfamily are known, and the finding of a new species on the island of Hispaniola suggests that further species may occur on the Caribbean islands. No key to the Neo-tropical species of the subfamily has been published, so such a key is given below, this key including the species described as new. The key is based on external characters since so few species have been adequately examined and the male genitalia described.

KEY TO THE NEW WORLD BRACHYLABIINAE

1. Eyes smaller, as long as length of head behind the eyes or smaller 2
– Eyes larger, much longer than the length of head behind the eyes 6
2. Very small species, body length 4 mm; pronotum comparatively large, eyes very small; in nests of ants. Brazil . . . . . *Brachylabis lenkoi* Brindle
– Larger species, body length at least 9 mm; not associated with ants 3

3. Mesonotal ridges only represented by folds; pronotum longer than broad; smaller, body length 9 mm. . . . . *Brachylabis allardi* sp. n.
– Mesonotal ridges distinct; pronotum longer than broad or shorter; larger, body length 10 mm. 4

4. Pronotum one and half times as long as broad, widened posteriorly, and without a median longitudinal furrow; body length 10 mm or so, forceps 2 mm. Brazil. . . . . *Brachylabis coriacea* Burr
– Pronotum as broad as long or almost so, widened posteriorly and with a median longitudinal furrow 5

5. Pronotum as broad as long; body length 10 mm, forceps 2 mm. Chile . . . . . *Brachylabis chilensis* (Blanchard)
– Pronotum rather longer than broad; cuticle strongly punctured; body length 10–15 mm, forceps 1–2 mm. Brazil . . . . . *Nannisolabis punctulata* Moreira

6. Mesonotum with lateral longitudinal ridges 7
– Mesonotum without such ridges. 9

7. Blackish, abdomen with a metallic sheen; pronotum transverse; body length 10–11 mm, forceps 0.75–1 mm. Brazil . . . . . *Ctenisolabis nigra* (Scudder)

– Abdomen without a metallic sheen; pronotum longer than broad. Costa Rica 8

8. Blackish, legs yellow, femora mainly black; body length 9.75 mm, forceps 1.75 mm. . . . . *Ctenisolabis fernandezi* (Borelli)
– Dark reddish-brown, legs yellowish-brown, femora brown; body length 7–8 mm, forceps 1–1.25 mm. . . . . *Ctenisolabis montana* (Borelli)

9. Cuticle strongly punctured and with yellow hairs; body length 10.7 mm, forceps 1.8 mm. Costa Rica . . . . . *Leptisolabis aliena* Borelli
– Cuticle finely punctured, and with long golden pubescence; body length 8 mm, forceps 1.75 mm. Guatemala . . . . . *Leptisolabis howardi* Burr

11. **Brachylabis allardi** sp.n.

Dark reddish-brown; legs yellowish-brown, antennae and mouthparts brown.

Male (Fig. 18): head tumid, as long as broad, lateral margins rounded, posterior margin truncate except medially where it is slightly concave; cuticle punctured and pubescent; eyes small. First antennal segment long, second segment quadrate, third twice as long as broad, fourth nearly one and half times as long as broad, fifth intermediate in length between third and fourth. Only first segment remaining in right antenna and first five segments remaining in left antenna of type.

Pronotum longer than broad, widened posteriorly, lateral margins slightly sinuate medially, posterior angles rounded, posterior margin straight; cuticle more finely punctured and pubescent than that of head. Mesonotum and metanotum more strongly and closely punctured, the former with a lateral fold on each side for most of length the fold curving medially posteriorly, but without a defined longitudinal ridge. Legs long, femora of anterior pair very broad, those of posterior four legs more slender; tibiae slender and almost as long as femora; basal segment of tarsi long and slender, especially those

of posterior pair of legs, second segment short in anterior four legs, relatively long in posterior pair; third segment of tarsi long; all tarsal segments with numerous yellow hairs, relatively short, and more dense ventrally. Proportion of lengths of femur, tibia, and the three tarsal segments of the posterior legs as follows: 5 : 4.5 : 2.25 : 0.75 : 1.3.

Abdomen widened medially, rather depressed, strongly narrowed basally and distally; tubercles on fourth segment small; cuticle strongly and closely punctured, more sparsely pubescent, hairs short and brown; last tergite transverse, posterior margin almost straight but produced slightly above the base of each branch of the forceps. Penultimate sternite transverse, posterior margin convex and with a median excision (Fig. 19). Forceps cylindrical, well separated at base, branches broader at base and narrowed distally, the distal part more curved. Genitalia with virga partially sclerotized, the parameres acuminate distally, partially membranous (Fig. 17).

Length: body 9 mm, forceps 1 mm.

Female: unknown.

HISPANIOLA: ♂ holotype, Loma Constanza, Dominican Republic, 5200 ft. in altitude, 4.XII.1947 (H. A. Allard) (USNM).

This species is named after the collector. It is mainly distinct by the mesonotum having lateral folds instead of distinct lateral ridges, by the long head and smaller eyes, these latter being relatively smaller in *allardi* than in *coriacea* or *punctulata*, and by the smaller size.

LABIDURIDAE

This small family is mainly Old World in distribution, and only the subfamily Labidurinae is represented in the Neo-tropical Region.

LABIDURINAE

Of the Neo-tropical genera, one, *Labidura* Leach, is recorded from the Caribbean, and two species are involved. *Labidura riparia*

(Pallas) and *Labidura xanthopus* (Stal) are closely similar to each other, but whilst the former species is cosmopolitan and is distributed throughout the tropics and subtropics of the World, the latter is entirely Neotropical in distribution, and is recorded from the northern part of South America where it appears to replace *riparia*, although it does not seem to be very common.

Labidura riparia is very variable in colour, and also in certain structural features, although the species is always easily recognized, and numerous synonyms have been published. In view of this variation the exact status of *xanthopus* is interesting, since it has been thought possible that this is another form of *riparia*. BRINDLE (1966) considered *xanthopus* as a distinct species on account of the different shape of the parameres of the male genitalia, although the only known external character to separate these two species was the presence, in the male only, of short longitudinal ridges near the posterior margin of the distal abdominal tergites in *xanthopus*, and their absence in *riparia*. These ridges resemble the milling of the edges of a coin, and KIRBY (1891) erected the genus *Demogorgon* on their presence, although this genus is now considered to be synonymous with *Labidura*. There was no known character to separate the females of the two species, apart from the more slender build of *xanthopus*, and the usually more contrasting colouration.

Some of the difficulty in deciding on the status of *xanthopus* was that material referable to this species has not been available in any numbers, and most specimens examined have been females. However, recently more material of *xanthopus* has been received from South America and another external character, which is constant in both sexes, has been noted. This is the shape of the pronotum; in *riparia* the pronotum is transverse and parallel-sided (Fig. 14), whilst in *xanthopus* the pronotum is longer than broad and widened posteriorly (Fig. 15). This character has been used to separate all available specimens of the two species and in all the males referred to *xanthopus* on the shape of the pronotum, the parameres are club-shaped and rounded at the tips, whilst in the males referred to *riparia* on the same character the parameres are parallel-sided and have a distinct apex (Fig. 16).

The examination of this new material shows that *xanthopus* is a

distinct species and can be separated from *riparia* by the shape of the pronotum in both sexes; the presence or absence of the short longitudinal ridges on the distal abdominal tergites of the male is a useful additional character. The shape of the parameres of both species is distinctive, and from the material studied, invariable.

BRINDLE (1971a) recorded a female of *xanthopus* from Dominica, but this specimen was examined before the additional material became available. The specimen was compared to specimens in the Manchester Museum, but the females in the series of *xanthopus* in the collection were slightly mixed, so that it is not certain that the female from Dominica was correctly assigned. A further examination of this specimen is desirable.

However, it is clear that *riparia* is the dominant species in the Caribbean, and if the Dominican specimen is correctly referable to *xanthopus*, this species is likely to be no more than an adventive in the Caribbean, and its main centre lies in South America.

KEY TO SPECIES OF LABIDURA

1. Pronotum transverse, sides more or less parallel (Fig. 14); distal abdominal tergites of male without short longitudinal ridges near posterior margins; parameres of male genitalia parallel-sided, and with a distinct apex (Fig. 16). . . . . *Labidura riparia* (Pallas)
- Pronotum longer than broad, widened posteriorly (Fig. 15); distal abdominal tergites of male with short longitudinal ridges near posterior margins; parameres of male genitalia club-shaped, evenly rounded apically. . . . . *Labidura xanthopus* (Stal)

12. **Labidura riparia** (Pallas)

Forficula riparia PALLAS, 1773, Reise Russ. Reichs *2*: 727 (Siberia).
Forficula bidens OLIVIER, 1791, Encycl. Méthod. *6*: 466 (Jamaica).
Forficesila affinis Guérin & Ménéville in RAMÓN, 1836, Hist. Cuba Ins. *7*: 137(Cuba).
Labidura riparia (Pallas); BORMANS, 1880, Comp. Red. Soc. ent. Belge *1880*: 1 (St. Barthélemy).
Labidura riparia (Pallas); BOLIVAR, 1888, Mem. Soc. zool. France *1*: 1 (Cuba).

Labidura riparia (Pallas); BURR, 1910, Proc. U.S. natn Mus.*38*:449 (Cuba; Bermuda Puerto Rico).

Labidura bidens (Olivier); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 640 (Bahamas; Cuba; Puerto Rico).

Labidura bidens (Olivier); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 323 (Dominican Republic).

Dark brown, variegated with yellow. Head yellow to brown, pronotum brown or dark brown, lateral margins yellow; elytra dark brown, sutures and lateral margins yellow, wings yellow, dark brown externally; legs yellow; abdomen dark brown, usually yellowish laterally, forceps yellow or brown. Cuticle of head smooth that of pronotum, elytra, wings and abdomen somewhat rugose, although usually finely so, and punctured. Head broad, eyes small, pronotum tranverse, sides parallel, posterior margin convex; elytra and wings normally developed in specimens examined, but elytra may be short and the wings absent or concealed. Abdomen long, rather depressed, wide, last tergite transverse, depressed medially near posterior margin and produced above the base of each of the forceps, median part of posterior margin with or without two small teeth. Forceps of male with branches widely separated at base, each branch only slightly curved and with one inner tooth (Fig. 14); those of female with branches shorter, straight except at apices, inner margin dentated, branches contiguous. Parameres of male genitalia parallel-sided, with distinct apex; virga distinctive of the subfamily, having a sinuous inner tube, and broadened basally (Fig. 16).

Length: body 14–26 mm, forceps 5–10 mm (males), 3.5–5 mm (females).

FLORIDA: *Virginia Key*, Mar. Lab., beach debris, Sta. 689, 4.IX.1963, 1 ♀ (H).
CUBA: La Juanita, Cienfuegos, IV.1967, 1 ♂; Pica Pica, sumidero, P. Rio, VIII.1966, 1 ♀ (A).
PUERTO RICO: *Isla Magueyes*, La Parguera, plant decay with some manure, Sta. 700, 10.IX.1963, 1 ♀ (H).
ST. MARTIN: Saline de Grande Case, shore of saltpan, Sta. 1141, 20.V.1949, 3 ♂, 3 ♀; Great Saltpond, Sta. 463, 25.V.1949, 2 ♀; Philipsburg, 21.V.1949, 1 ♀; Simson Bay, former lagoon, now salt lake, Sta. 1130B, 16.X.1963, 1 ♂, 2 nymphs; Atwell's Pond, salty mud flat, 26.IX.1963, 1 ♀ (H).
ST. KITTS: Frigate Bay Saltpond, Sta. 677, 20.VII.1955, 1 ♂ (H).
BARBUDA: Codrington Village, Low Pond, cattle pond, Sta. 674a, 21.VII. 1967, 2 nymphs (H).

GUADELOUPE: Pointe-des-Châteaux, boulders, 10.X.1963, 9 ♂, 5 ♀ (B).
LA DÉSIRADE: Grande-Anse, common, 10–12.XII.1966, 13.II.1967, 3 ♂, 3 ♀ (B).
ARUBA: Oranjestad (I. Tjon Sie Fat), 1963, 5 ♂ (H).

Distribution: Cosmopolitan in World distribution, occurring more commonly perhaps in sandy areas, and mainly continental (Asia, Africa, India. etc.), but it occurs on many continental islands and some oceanic islands. It is mainly tropical or subtropical in distribution, but extends much further north in Asia.

13. **Labidura xanthopus** (Stal)

Forficula xanthopus STAL, 1855, Ofvers. K. Vetensk. Akad. Forh. *12*: 48 (Brazil).
Labidura xanthopus (Stal); BRINDLE, 1971, Smiths. Contr. Zool. *63*:13 (Dominica).

Very similar to *riparia* in colouration, but usually more contrasting. Yellowish, variegated with dark brown or blackish. Head and pronotum yellow, or with pronotum blackish medially, elytra blackish, sutures and lateral margins yellow; wings yellow, dark brown or blackish externally, abdomen yellow with a broad irregular median longitudinal band; legs yellow, forceps yellow. The colour however can vary from an almost uniformly light brown or yellowish to almost blackish. Structurally similar to *riparia*, but the male usually has a series of short longitudinal ridges near the margins of the posterior abdominal tergites, but these may be weakly defined. Parameres of male genitalia club-shaped, being wider distally, and with the apices evenly rounded. Pronotum longer than broad, wider posteriorly (Fig. 15).

Length: body 14–25 mm, forceps 6–9 mm (males), 3.5–5 mm (females).

Distribution: Neo-tropical in World distribution, and recorded from Brazil, Argentine, Bolivia, and Suriname on the American mainland. – Dominica.

The female from Dominica in BRINDLE (1971a) is the only record of this species from the Caribbean. The doubts regarding this record have already been mentioned.

LABIIDAE

Of the six subfamilies known from the Neo-tropical Region, three are represented in the Caribbean, as separated in the key to families and subfamilies.

LABIINAE

This subfamily now contains only two Neo-tropical genera, *Labia* Leach, and *Purex* Burr, of which the last genus is restricted to the mainland of South and Central America. Five species of *Labia* are now recorded from the Caribbean, the identity of *Labia annulata* (Fabricius) being uncertain, whilst *Labia pilicornis* (Motschulsky) is here recorded for the first time from the Caribbean.

The genus *Labia* usually consists of small species, often dull in colouration and with the elytra and wings punctured and pubescent. *L. dorsalis* is unusual in having elytra and wings which are brightly shining and metallic, and almost glabrous.

KEY TO SPECIES OF LABIA

1. Elytra and wings shining, and with a metallic sheen, smooth, impunctate, and with a few pale hairs; male forceps strongly curved, pygidium large, transverse (Fig. 24); female forceps less curved, broad at base, pygidium large (Fig. 28) . . . . . *Labia dorsalis* (Burmeister)
– Elytra and wings without a metallic sheen, pubescent . . . 2

2. Pronotum transverse, as wide as head; a dull species, male and female forceps with branches almost straight, male pygidium triangular or with apex bifid (Fig. 20); female pygidium small, quadrate (Fig. 26) . . . . . *Labia pilicornis* (Motschulsky)
– Pronotum quadrate, narrower than the head, or male forceps strongly curved; pygidia of both sexes otherwise. 3

3. Slender and depressed species, blackish in colour, abdomen and forceps reddish; abdomen more or less parallel-sided; both male

and female forceps very broad at base (Fig. 22, 23). . . . . *Labia curvicauda* (Motschulsky)

– Broad and depressed species, dark brown or brown in colour, abdomen and elytra similarly coloured; male and female forceps not very broad at base 4

4. Male forceps simple, without an inner tooth on each branch; female pygidium about as long as broad, postero-lateral projections slightly diverging, occupying most of posterior margin . . . . . *Labia annulata* (Fabricius)

– Male forceps with an inner tooth on each branch (Fig. 25); female pygidium transverse, postero-lateral projections small, posterior margin concave (Fig. 27) . . . . . *Labia arcuata* Scudder

14. **Labia curvicauda** (Motschulsky)

Forficesila curvicauda MOTSCHULSKY, 1863, Bull. Soc. nat. Moscou *36*: 2 (Ceylon).
Labia arcuata BOLIVAR, 1888 (not Scudder 1876), Mem. Soc. zool. France *1*: 4 (Cuba).
Labia curvicauda (Motschulsky); BURR, 1908, Bull. Mus. natn Hist. nat. Paris *1908*: 33 (Martinique).
Labia curvicauda (Motschulsky); HEBARD, 1917, Proc. Acad. nat. Sci. Philad. *1917*: 240 (Trinidad).
Labia curvicauda (Motschulsky); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 640 (Cuba; Hispaniola; Jamaica).
Labia curvicauda (Motschulsky); REHN, 1925, Trans. Am. ent. Soc. *51*: 25 (Jamaica).
Labia curvicauda (Motschulsky); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 323 (Dominican Republic).
Labia curvicauda (Motschulsky); BRINDLE, 1971, J. nat. Hist. *5*: 174 (Puerto Rico; Cuba; Haiti; Dominican Republic; Jamaica; Trinidad).
Labia curvicauda (Motschulsky); BRINDLE, 1971, Smiths. Contr. Zool. *63*:18 (Dominica).

A small depressed species, rather shining; black, legs yellow, femora usually partially darkened, abdomen and forceps reddish, antennae yellow or brown; pronotum sometimes yellow. Head broad, rather cordiform in shape, eyes small; pronotum small, narrower than head, slightly longer than broad, parallel-sided, smooth; elytra and wings long, both strongly pubescent; legs short. Abdomen parallel-sided, but narrower at base. Forceps of both

sexes very broad at base, those of male strongly curved distally (Fig. 22), those of female straight (Fig. 23).

Length: body 4–5 mm, forceps 0.75–1.25 mm.

JAMAICA: Balaclava, 15.II.1937 (Blackwelder), 1 ♂, 1 ♀ (USNM).
PUERTO RICO: Puerto Rico, VIII.1933, 2 ♂ (USNM).
ST. KITTS: St. Kitts, 30.X.1936 (Blackwelder), 1 ♂ (USNM).
GUADELOUPE: Réduit, 400 m, III.1965, 11 sp.; Grand-Étang, 400 m, 6.VIII. 1960, 3 sp.; Abymes, Beausoleil, 50 m, 7.V.1966, 5 sp.; Le Moule, Gardel, sugar cane, 10 m, 27.XI.1962, 32 sp. (B).
MARIE-GALANTE: Saint-Louis, bananas, 15.I.1965, 6 sp. (B).
DOMINICA: Dominica, without date, 1 ♂ (BM).
ST. LUCIA: St. Lucia, 24/29.III.1936 (Blackwelder), 1 ♂, 1 ♀ (USNM).
ST. VINCENT: St. Vincent (Sharp), 1 ♂ (BM).
GRENADA: Grenada, without date, 1 ♀ (BM).
TRINIDAD: Trinidad, 1.I.1936 (Blackwelder), 1 ♂ (USNM).

Distribution: Rather sporadically distribution on the Caribbean islands. – Cosmopolitan in World distribution, and often recorded as an adventive. Occurs in all faunal Regions but is restricted to tropical or subtropical climates as a general rule.

15. **Labia pilicornis** (Motschulsky)

Forficesila pilicornis MOTSCHULSKY, 1863, Bull. Soc. nat. Moscou *36*: 2 (Ceylon).
Labia sp. CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (3 ♀, Baracoa, Cuba).

A dull dark brown species, more or less uniformly coloured, or with elytra and wings lighter in colour; head, pronotum, and abdomen sometimes blackish. Cuticle punctured and pubescent, except for that of head, which is almost glabrous. Head transverse, eyes large; pronotum slightly transverse, posterior margin convex; elytra and wings normally developed; abdomen broad, depressed. Each branch of male forceps trigonal for most of length, without an inner tooth, or with a small tooth near apex, pygidium triangular, either with apex almost pointed or with apex truncate, or slightly bilobed (Fig. 20); forceps of female shorter, branches closer together at base, broader at base, narrowed distally, pygidium short, broad, apex concave (Fig. 26). Male genitalia with narrow, membraneous parameres, virga long, and associated with small denticulated areas (Fig. 21).

Length: body 3–4 mm, forceps 0.75–1 mm (males), 0.5–0.75 mm (females).

CUBA: Stgo de las Vegas, Prov. Habana, X.1962, 1 ♂; V.1963, 1 ♀; II.1964, 1 ♀; Arroya Naranjo, Prov. Habana, 15.V.1937, 1 ♂, 2 ♀; Marianao, Habana, VI.1969, 3 ♀; San Diego, III.1964, 1 ♀ (A).

Distribution: Cuba.

Apparently restricted to Cuba as far as the Neo-tropical Region is concerned; the description of the unnamed females by CAUDELL (1907) agrees with the present species. *Labia rogenhoferi* Bormans, from Ecuador is closely similar to *pilicornis* as is *L. rehni* Hebard from Florida; the latter was thought by HEBARD in unpublished notes to be possibly synonymous with the present species (GURNEY, 1950). These three species may prove to be conspecific.

L. pilicornis is largely Oriental in distribution but from recent records it may be circumtropical, and is classed as cosmopolitan in the present paper.

16. **Labia dorsalis** (Burmeister)

Forficula dorsalis BURMEISTER, 1838, Handb. Ent. *2*: 754 (Colombia).
Labia trinitatis BRUNER, 1906, Jl. N.Y. ent. Soc. *14*: 136 (Trinidad).
Labia trinitatis Bruner; CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (Trinidad; ? Dominican Republic).
Labia trinitatis Bruner; BURR, 1910, Proc. U.S. natn Mus. *38*: 456 (Cuba; Dominica).
Labia dorsalis (Burmeister); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 641 (Montserrat).
Labia dorsalis (Burmeister); HEBARD, 1920, Proc. Acad. nat. Sci. Philad. *1920*: 348 (Guadeloupe).
Labia dorsalis (Burmeister); BRINDLE, 1971, J. nat. Hist. *5*: 175 (Dominican Republic; Cuba; Montserrat).
Labia dorsalis (Burmeister); BRINDLE, 1971, Smiths. Contr. Zool. *63*:18 (Dominica).

A shining, dark species; head and pronotum blackish; elytra and wings blackish, more brightly shining, and with a metallic sheen; antennae brown to black; legs yellow, femora with basal half darkened and tibiae darker medially; abdomen and forceps reddish. Head broad, eyes small; pronotum quadrate, parallel-sided; elytra and wings impunctate, with isolated pale hairs; abdomen broad, depressed, with more closely spaced yellow hairs. Forceps of male strongly curved, each branch with an inner tooth (Fig. 24); those

of female with branches more or less straight, wider at base (Fig. 28).

Length: body 5 mm, forceps 0.5–0.75 mm.

GUADELOUPE: Saint-Claude, Papaye, 800 m, 23.I.1964, 13 sp.; Riv. Baillif, Boucan Audet, 500 m, 11.VIII.1965, 2 sp.; Grand-Étang, 400 m, 6.VIII.1960, 1 sp. (B).
ST. LUCIA: St. Lucia, 29.III/21.IV.1936 (Blackwelder), 4 ♀ (USNM).
ST. VINCENT: St. Vincent, 1 ♂ (USNM); Upper Richmond Valley, 18.I.1889 (Smith), 2 ♀; St. Vincent, leeward side (Smith), 1 ♂, 1 ♀ (BM).
GRENADA: Chantilly Est. (windward side) (Smith), 2 ♂ (BM).

Distribution: Apparently sporadically distributed on the Caribbean islands. – Neo-tropical in World distribution, and recorded on the American mainland from Colombia and Venezuela northwards to Mexico. It is a distinctive species by reason of the metallic brightly shining elytra and wings, although more than one species may be involved.

17. **Labia arcuata** Scudder

Labia arcuata SCUDDER, 1876, Proc. Boston Soc. nat. Hist. *18*: 257 (Brazil).
Labia arcuata Scudder; BRINDLE, 1971, J. nat. Hist. *5*: 176 (Trinidad).

Head dark brown; pronotum, elytra, and wings dark brown to blackish, rather shining; legs dark brown or brown, apices of femora and bases of tibiae paler in colour; abdomen reddish-brown to dark reddish-brown. Elytra punctured and pubescent. Forceps of male strongly curved, each branch slender and with one inner tooth which has a notch anterior to it (Fig. 25); forceps of female with branches slender, almost straight (Fig. 27).

Length: body 4–6.5 mm, forceps 1–1.75 mm.

GUADELOUPE: Soufrière, 900 m, 12.IV.1963, 1 sp.; Matouba, 800 m, 9.II. 1965, 2 sp.; Palmiste, 500 m, 23.IV.1964, 2 sp.; Grande-Rivière-à-Goyave, 400 m, 25.VI.1961, 1 sp.; Vernou, 300 m, 8.V.1963, 1 sp.; Solitude, 150 m, 25.II.1966, 1 sp.; Papaye, 800 m, 12.II.1965, 2 sp.; 19.X.1963, 1 sp.; Riv. Baillif, 600 m, 11.VIII.1965, 1 sp. (B).
ST. VINCENT: St. Vincent, 1 ♀ (BM).
GRENADA: Grenada, 2 ♂, 2 ♀ (BM).
TRINIDAD: near watertrack at North Coast Road, 200 m, 29.I.1955, 2 ♂, 3 nymphs (H); Caparo, VI.1913 (Klages), 2 ♂, 1 ♀ (BM).

Distribution: Restricted to the southern islands of the Caribbean, and apparently not frequent. – Neo-tropical in World distribution, and recorded on the American mainland from Brazil and Peru northwards to Mexico.

18. **Labia annulata** (Fabricius)

Forficula annulata FABRICIUS, 1793, Ent. Syst. *2*: 4 (West Indies).
Labia annulata (Fabricius); BRINDLE, 1971, J. nat. Hist. *5*: 176.

Similar to *arcuata* in colouration; pronotum black or brown; elytra and wings shining black, sometimes weakly metallic, pubescent and punctured; legs yellow with darker rings on segments. Similar to *arcuata* in structure but the branches of the male forceps have no inner teeth and the pygidium of the female differs.

Length: body 3.75–4.5 mm, forceps 0.75–1 mm.

This species is taken as defined by HEBARD (1917b); it appears to be closely related to *arcuata*, and may be a form of this species. The syntypes of *annulata* are in the Museums at Kiel and Copenhagen, and a re-examination of these is desirable so that the species can be adequately re-described. The record of *Labia annulata* in BURR (1912) from St. Vincent and Grenada could refer either to *arcuata* or *dorsalis*.

SPONGIPHORINAE

This subfamily includes the majority of the Neo-tropical species of the Labiidae, and is closely related to the subfamily Labiinae. It is mainly distinct by the longer third antennal segment, and the eyes are often large or very large; the elytra and wings are typically glabrous and smooth. Most species are rather small, but *Spongiphora croceipennis* Serville is large. Of the six Neo-tropical genera, four are recorded from the Caribbean, and twelve species are represented.

KEY TO GENERA AND SPECIES OF SPONGIPHORINAE

1. Head very transverse and eyes very large (Fig. 29); large species, body length 15 mm or more; male forceps with branches slender and very long, over 10 mm in length . . . . . *Spongiphora croceipennis* Serville

– Head much less transverse and eyes relatively smaller; smaller species, body length 10 mm or less; male forceps less elongated 2

2. Pronotum much longer than broad, lateral margins sinuate (Fig. 47); very small species, body length 3.26 mm . . . . . *Formicilabia caribea* Rehn & Hebard
– Pronotum not so elongated, nor so sinuate laterally . . . . .

3. Distal antennal segments cylindrical or almost so 4
– Distal antennal segments strongly moniliform (*Marava*) . . 6

4. Elytra with a yellow humeral patch; legs with femora darkened, smaller species, body length below 6 mm. . . . . *Spongovostox ghilianii* (Dohrn)
– Elytra unicolorous; legs uniformly yellow or orange; larger species, body length 8 mm or more (*Vostox*) 5

5. General colouration blackish, wings partially and legs entirely orange or orange-yellow; male pygidium more produced posteriorly (Fig. 31). Cuba . . . . . *Vostox cabrerae* Rehn
– General colouration yellowish or reddish-brown; wings partially and legs entirely yellow; male pygidium less produced medially (Fig. 32). Trinidad . . . . . *Vostox insularis* (Bruner)

6. Pronotum as broad as long (Fig. 37). 7
– Pronotum transverse (Fig. 38) 9

7. Larger, body length 8–11 mm, male forceps long, male pygidium as broad as long (Fig. 44) . . . . . *Marava jamaicana* (Rehn & Hebard)
– Smaller, body length 5–6 mm, male forceps short, male pygidium transverse. 8

8. Male pygidium with posterior margin produced medially (Fig. 37) . . . . . *Marava unidentata* (Beauvois)
– Male pygidium with posterior margin not produced medially (Fig. 40) . . . . . *Marava pulchella* (Serville)

9. Pronotum more transverse and less widened posteriorly (Fig. 38) 10
– Pronotum less transverse and more widened posteriorly . 11

10. Elytra longer, posterior margin oblique and slightly concave; each branch of male forceps with ventral inner edge widened, pygidium nearly quadrate (Fig. 34) . . *Marava quadrata* sp.n.
– Elytra short, posterior margin straight (Fig. 38); each branch of male forceps not widened on ventral inner edge, pygidium transverse (Fig. 39) . . . . . *Marava arachidis* (Yersin)

11. Larger species, body length 7 mm or more; wings with a yellow basal spot . . . . . *Marava modesta* (Bruner)
– Smaller species, body length 5–6 mm; wings absent or concealed or all dark in colour . . . . . *Marava dominicae* Rehn & Hebard

19. **Spongiphora croceipennis** Serville

Spongiphora croceipennis SERVILLE, 1831, Annls Sci. nat. *22*: 31 (Brazil).

Head and pronotum dark reddish-brown; elytra reddish-brown; legs yellow, femora sometimes slightly darker; abdomen blackish-brown; antennae brown; wings yellow; forceps reddish to dark brown. Head very transverse and eyes large (Fig. 29); pronotum not strongly widened posteriorly; elytra and wings fully developed; basal abdominal tergites with numerous small tubercles, and distal tergites with similar tubercles along the posterior margin of each. Forceps of male with long and slender branches, inner margin with one inner tooth (Fig. 30), or with short and broader branches; forceps of female with branches slender, sinuate, and almost contiguous.

Length: body 15–20 mm, forceps 10–19 mm (males), 6–10 mm (females).

GUADELOUPE: Soufrière, La Citerne, 1200 m, 6.IV.1965, 2 larvae; Faux Piton de Bouillante, 800 m, 28.I.1966, 2 larvae; Riv. Sainte-Marie, 400 m, 6.IV. 1966, 15 ad. & larvae; Duclos, 250 m, 16.II.1962, 3 sp.; XI.1968, 1 ♂; Grande-Rivière, 100 m, 28.VIII.1960, 3 larvae (B).
TOBAGO: Speyside, VII.1964 (J. Maldonado C), 1 ♂ (USNM).

Distribution: Brazil, Argentine, Peru, Venezuela, Surinam and Panama. The present records, Guadeloupe and Tobago, are the first for the Caribbean.

20. **Vostox cabrerae** Rehn

Spongophora brunneipennis Bolivar, 1888 (not Serville, 1839) Mem. Soc. zool. France *1*: 5 (Cuba).
Vostox cabrerae Rehn, 1925, Trans. Am. ent. Soc. *51*: 20 (Cuba).

Head, pronotum, and elytra blackish; wings orange, sutural and lateral margins blackish; legs orange-yellow; abdomen dark reddish-brown, blackish laterally. Head broad, eyes large; pronotum quadrate, elytra and wings well developed; abdomen broad and depressed. Forceps of male with branches rather slender, each branch with one inner tooth beyond midpoint, basal part of inner edge dentated, pygidium large (Fig. 31). Forceps of female short, branches relatively broad, narrowed distally.

Length: body 8–10 mm, forceps 3.75–6 mm (males), 2.5 mm (females).

Distribution: Cuba.

This species is closely related to *Vostox brunneipennis* (Serville), which occurs in the southern part of the Nearctic Region, mainly in southeast areas of the United States. *V. cabrerae* seems to warrant specific status on account of the very dark colouration of the elytra and wings, and by the structural differences in the forceps and pygidium of the male. The male genitalia of these two species have not yet been compared.

21. **Vostox insularis** (Bruner)

Labia insularis Bruner, 1906, Jl. N.Y. ent. Soc. *14*: 137 (Trinidad).
Vostox brunneipennis (Serville), Hebard, 1917, Trans. Am. ent. Soc. *43*: (partim).

Yellowish to reddish-brown; legs yellow, abdomen dark reddish-brown. Head transverse, posterior margin concave, occiput behind eyes slightly inflated; eyes large; first antennal segment short. Pronotum transverse, parallel-sided, posterior margin weakly

convex. Elytra and wings normally developed, very weakly and sparsely punctured; wings broadly yellow at base, abdominal tergites relatively finely punctured. Each branch of male forceps broad, wider distally, trigonal for most of length, ventral inner margin darkened and crenulate, dorsal margin darkened, very slightly crenulate; ventral margin with a tooth about one third from base; pygidium transverse, widened posteriorly, posterior margin produced medially (Fig. 32). Female forceps with branches shorter, trigonal basally, cylindrical distally, straight except at apices, and with a dorsal projection near base.

Length: body 7–8 mm forceps 2.5–3 mm.

TRINIDAD: Simla, Arima Valley, 1/5.II.1966 (S.S. and W. D. Duckworth), 1 ♂ (USNM).

Distribution: Endemic to Trinidad.

HEBARD (1917a) synonymized *insularis* with *brunneipennis* after a comparison of the female type of the former with females of the latter. BRINDLE (in press) suggested that since *brunneipennis* has been found to be a northern species, ranging from Panama northwards into the United States, *insularis* is probably synonymous with *punctipennis* Stal, which is found from Brazil and Argentine northwards to Panama. However the present male, which is referred to this species on account of its locality, appears to be more related to *brunneipennis*, but the branches of the forceps are much heavier than in that species, although the pygidium of both species are similar. It seems best to regard *insularis* as a distinct species on account of the differences in the male forceps, and the wide separation of this species from the areas in which *brunneipennis* is recorded. If the present male is correctly referred to the present species, it is the first record of this sex. The females of *insularis* and *brunneipennis* may well be indistinguishable.

22. **Spongovostox ghilianii** (Dorhn)

Labia ghilianii DOHRN, 1864, Stettin. ent. Ztg. *25*: 424 (Brazil; French Guiana; Venezuela).

Spongovostox ghilianii (Dohrn); BRINDLE, 1971, Smiths. Contr. Zool. *63*: 9 (Dominica).

Head and pronotum black, antennae yellowish-brown; elytra dark brown with a yellow humeral patch, rather vaguely defined; wings dark brown, yellow at base; legs yellow, basal part of femora darkened. Eyes very large; pronotum transverse, widened posteriorly; elytra and wings normally developed; abdomen broad and short. Male forceps with branches well separated at base, each branch simple; pygidium short, and with a dorso-median peg-like projection (Fig. 33). Female not examined.

Length: body 4.75–5.25 mm, forceps 1–1.25 mm.

GUADELOUPE: Duclos, 250 m, 24.VIII.1960, 4 sp.; Forêt des Bains-Jaunes, 900 m, 19.I.1966, 1 ♀ (B).
MARIE-GALANTE: Saint-Louis, Pointe Cimetière, 15.I.1966, 1 ♀ (B).

Distribution: Brazil, French Guiana, Venezuela and Dominica; now Guadeloupe and Marie-Galante.

23. **Marava arachidis** (Yersin)

Forficula arachidis YERSIN, 1860, Ann. Soc. ent. France *8*: 509 (Marseille, France, introduced).
Labia gravidula Gerstaecker; BOLIVAR, 1888, Mem. Soc. zool. France *1*: 5 (Cuba).
Apterygida arachidis (Yersin); REHN, 1905, Proc. U.S. natn. Mus. *29*: 513 (Jamaica).
Labia gravidula Gerstaecker; CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (Jamaica; Puerto Rico).
Marava arachidis (Yersin); BRINDLE, in press, J. nat. Hist.

Reddish-brown to dark brown, sometimes yellowish-brown. Head and pronotum may be darker; antennae yellow or brown, usually with basal segments paler in colour; legs yellow, femora dark basally; abdomen blackish laterally. Head broad, eyes small; pronotum transverse, elytra short and wings absent or concealed (Fig. 38); abdomen broad and depressed, mainly impunctate. Each branch of male forceps arcuate, cylindrical, widely separated from the other branch, and with one inner tooth towards apex, pygidium broad (Fig. 39). Forceps of female with branches closer together, more or less straight.

Length: body 6–8 mm, forceps 1.25–1.5 mm.

CUBA: Havana, 21.V.1941 (Bruner), 1 ♀ (USNM).
ST. BARTHÉLEMY: no data, ex. coll. de Bormans (tip of abdomen missing) (BM).
GUADELOUPE: Duclos, 250 m, from the docks of Pointe-à-Pitre, common, IV.1963 and 24.VIII.1965, 3 sp. (B).

Distribution: Cuba, Jamaica, Puerto Rico; now St. Barts and Guadeloupe.

Although this species has two forms, one in which the elytra and wings are normally developed and another in which the elytra are short and the wings absent or concealed, all the New World specimens examined belong to the latter form. The species is cosmopolitan in distribution, and often occurs as an adventive in many countries, but is tropical or subtropical and does not establish itself in cool climates.

24. **Marava unidentata** (Beauvois)

Forficula unidentata BEAUVOIS, 1805, Ins. rec. Afr. Amer., Orth.: 165 (Dominican Republic).
Labia brunnea SCUDDER, 1876, Proc. Boston Soc. nat. Hist. *18*: 258 (Cuba).
Labia brunnea Scudder; BORMANS, 1880, Comp. Red. Soc. ent. Belge *1880*: 5 (St. Barthélemy).
Labia burgessi BOLIVAR, 1888 (not Scudder, 1876); Mem. Soc. zool. France *1*: 4 (Cuba – wingless specimen).
Labia unidentata (Beauvois); BOLIVAR, 1888, Mem. Soc. zool. France *1*: 4 (Cuba – winged specimen).
Labia brunnea Scudder; REHN, 1905, Proc. U.S. natn. Mus. *29*: 507 (Cuba).
Labia brunnea Scudder; CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (Trinidad; Dominican Republic).
Labia pulchella (Serville); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 168 (Dominican Republic).
Labia burgessi BURR, 1908 (not Scudder, 1876); Bull. Mus. natn. Hist. nat. Paris *1908*: 32 (Cuba).
Labia unidentata (Beauvois); BURR, 1910, Proc. U.S. natn. Mus. *38*: 451 (partim) (records refer to the present species from Cuba; Dominican Republic; Jamaica; St. Vincent; Trinidad).
Labia brunnea Scudder; BURR, 1912, Annln naturh. Mus. Wien *26*: 88 (Grenada; St. Vincent).
Prolabia unidentata (Beauvois); BURR, 1912, Annln naturh. Mus. Wien *26*: 90 (St. Vincent).
Prolabia unidentata (Beauvois); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 647 (Bahamas; Cuba; Haiti; Dominican Republic; Jamaica; Puerto Rico).
Prolabia unidentata (Beauvois); HEBARD, 1920, Proc. Acad. nat. Sci. Philad. *1920*: 348 (Haiti).

Marava unidentata (Beauvois); BRINDLE (in press), J. nat. Hist. (Bahamas; Cuba; Hispaniola; Jamaica).

Reddish-brown, sometimes head and pronotum darker; antennae brown, basal segments yellow; legs yellow; elytra and wings darker when fully developed. Head broad, eyes variable in size. There are two forms –

(a) *unidentata*: eyes large, elytra and wings normally developed, wings slightly lighter in colour at base;

(b) *brunnea*: eyes small, elytra short, wings absent or concealed.

Each branch of male forceps arcuate, with one or two inner teeth on inner margin, branches well separated at base, pygidium transverse (Fig. 37); forceps of female with branches contiguous, (Fig. 41).

Length: body 5–6 mm, forceps 1.75–2.5 mm.

CUBA: S. Rangel, 27.I.1931 (Acuno y Otero) 1 ♂; Esp. Exp. Agronomía, Eca Coca, IV.1961, 1 ♂; Ciénaga de Zapata (Las Villas), XII.1965, 1 ♂, 1 ♀; Sierra de Rosario, Pinar del Rio, III.1968, 3 ♂; Sierra Maestra, P. Turquino, Oriente, VI.1963, 1 ♀ (A) (all wingless). – Jarahueca, Ota, 1800–2200 ft., 16.X.1965, 1 ♀; Pico Cardero, Turquino, VI.1963, 1 ♀; C. Baragua, 26/27.VII.1927, 1 ♀; Pico Turquino, 1650 ft., summit, 10/29.VI.1936, 1 ♀; Pen. Guanahacabibes, Carabelita, Pinar del Rio, X.1967, 1 ♀ (A) (all winged) – San Carlos, Est. Guantánamo; Los Caneos, Est., Guantánamo, numerous specimens of both sexes, all wingless (BM).

Distribution: Widely distributed on the Caribbean islands, and endemic.

25. **Marava pulchella** (Serville)

Forficula pulchella SERVILLE, 1839, Hist. nat. Orth.: 42 (New York State).
Labia burgessi SCUDDER, 1876, Proc. Boston Soc. nat. Hist. *18*: 266 (Florida).
Prolabia pulchella (Serville); REHN, 1925, Trans. Am. ent. Soc. *51*: 25 (Cuba).
Marava pulchella (Serville); BRINDLE, in press, J. nat. Hist.

Very similar to *unidentata*, both in colouration and structure, and similarly has two forms; the winged form is referable to *pulchella* and the wingless form is referable to *burgessi*. The only difference externally between the two species appears to be in the form of the male pygidium (Fig. 40) as given in the key.

Length: body 5–7 mm, forceps 1.75–2.25 mm.

Distribution: Cuba.

This species is recorded from the southern part of the United States, and is endemic, apart from a single record of one male and one female, taken at Camoa, Havana Province, in 1922, and recorded by REHN (1925). These specimens may have resulted from an accidental introduction as suggested by REHN (1925), although this author also considered that *pulchella* may occur in western Cuba whilst *unidentata* is limited to the eastern part. In general *pulchella* is the mainland species whilst *unidentata* is the Caribbean species. The record of a single female *pulchella* from the Dominican Republic in BRINDLE (1968a), probably refers to *unidentata*, since the character which was used to try to separate the females of this species and *pulchella* has been found to be unreliable.

26. **Marava modesta** (Bruner)

Labia modesta BRUNER, 1906, Jl. N.Y. ent. Soc. *14*: 137 (Trinidad).
Prolabia modesta (Bruner); HEBARD, 1917, Proc. Acad. nat. Sci. Philad. *1917*: 243 (re-examination of single female type).
Marava modesta (Bruner); BRINDLE, in press, J. nat. Hist.

Reddish-brown, shining; head darker, antennae brown; eyes large; posterior margin of head concave, dorsal surface tumid. Pronotum transverse, widened posteriorly, posterior margin weakly convex, yellow in colour laterally. Elytra and wings normally developed, glabrous and smooth; wings broadly yellow at base. Abdomen with tergites coriaceous. Forceps of female short, each branch trigonal at base, ventral edge dentated for basal two-thirds, apical third of branch slender, cylindrical, and curved medially (Fig. 36).

Length: body 7.5 mm, forceps 2 mm.

TRINIDAD: Simla, Arima Valley, 1/5.II.1966 (S.S. and W. D. Duckworth), 1 ♀ (USNM).

Distribution: Trinidad, endemic.

This species was previously only known from the single female type, which was re-examined by HEBARD (1917b), and who com-

pared the species to *M. dominicae*. In the females of both species the branches have no dorsal projection near the base. The present female is referred to this species from available details and is definitely a species of *Marava*; until a male can be obtained and associated with the females however, the separation of the species from closely related species remains uncertain, and only based on locality together with external differences which may not be specific.

27. **Marava dominicae** (Rehn & Hebard)

Prolabia mexicana BURR, 1910 (not Bormans, 1883); Proc. U.S. natn. Mus. *38*: 456 (Dominica).

Prolabia dominicae REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 643 (Dominica).

Marava dominicae (Rehn & Hebard); BRINDLE, in press, J. nat. Hist.

Marava dominicae (Rehn & Hebard); BRINDLE, 1971, Smiths. Contr. Zool. *63*: (Dominica).

Dark reddish-brown, shining; antennae dark brown, basal segments yellow; legs yellow, femora with brown rings; forceps and pygidium yellowish-brown. Head transverse, eyes large; pronotum transverse, widened posteriorly; elytra and wings normally developed or elytra short and wings absent or concealed. Abdomen depressed, tergites finely punctured. Each branch of male forceps almost straight, ventral edge dentated and with a large tooth before midpoint, pygidium large, posterior margin deeply concave (Fig. 43). Forceps of female with branches contiguous, more slender.

Length: body 5–6 mm, forceps 1.8–2.5 mm.

GUADELOUPE: Saint-Claude, Forêt des Bains-Jaunes, 800–1000 m, 3.VI.1961, 1 sp.; 19.I.1966, 2 sp.; XI.1966, 1 sp.; Papaye, 800 m, 25.I.1964, 1 sp.; Matouba, 800 m, 9.II.1965, 6 sp.; Sources Riv. Rouge, 1000 m, 12.I.1966, 4 sp.; Moscou, 700 m, 22.XI.1962, 2 sp.; Réduit, 400 m, III.1965, 2 sp.; 30.I.1964, 3 sp.; Grand-Étang, 400 m, 6.VIII.1960, 4 sp.; 16.XI.1962, 1 sp.; Riv. Sainte-Marie, 400 m, 6.IV.1966, 6 sp.; Forêt Metayer, 500 m, 11 sp.; Routhiers, 200 m, 7.IV.1965; Les Mamelles, 500 m, 12.XII.1963, 6 sp.; 21. IV.1965, 4 sp.; 7.VIII. 1965, 5 sp.; 18.VIII.1965, 3 sp.; Crête de Village, 600 m, 28.X.1965, 2 sp.; Faux Piton, 800 m, 28.I.1966, 2 sp.; Trace Victor-Hugo, 900 m, 26.XI.1965, 4 sp.; Riv. Baillif, 500 m, 11.VIII.1965, 2 sp.; forêt de Riv. Corossol, 300–400 m, 12.VIII.1962, 1 sp.; Les Abymes, Beausoleil, 20 m, 7.V.1966, 9 sp. (all in dead wood, under bark, etc.; B).

MARTINIQUE: Le Lorrain, under bark, 18.XII.1965, 1 sp.; Morne-Rouge, 300 m, Ananas, 26.VII.1965, 1 sp.; 30.VII.1966, 1 sp.; Grand-Rivière, under bark, 15.XII.1966, 1 sp. (B).

Distribution: Dominica; now Guadeloupe and Martinique.

28. **Marava jamaicana** (Rehn & Hebard)

Prolabia jamaicana REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 645 (Jamaica).
Prolabia jamaicana Rehn & Hebard; REHN, 1925, Trans. Am. ent. Soc. *51*: 25 (Jamaica).
Marava jamaicana (Rehn & Hebard); BRINDLE, in press, J. nat. Hist.

Dark reddish-brown, shining; antennae dark brown basal segments yellow; pronotum narrowly yellow laterally; legs brown, forceps and pygidium reddish. Head transverse, eyes large; pronotum as broad as long, evenly widened posteriorly; elytra short, wings visible or concealed, possibly sometimes absent; abdomen depressed, distal tergites punctured. Each branch of male forceps long, simple, pygidium prominent (Fig. 44). Forceps of female with branches contiguous, slender, each branch with a dorsal projection near base.

Length: body 8–11 mm, forceps 3–4 mm (males), 2.8–3.6 mm (females).

Distribution: Jamaica, endemic.

The pygidium of the male of this species appears to be variable in shape; those examined have the pygidium shaped as in Figure 44 (with the branch of the forceps); the single pygidium also figured is taken from REHN & HEBARD (1917).

29. **Marava quadrata** sp.n.

Dark reddish-brown; antennae brown; legs yellow.

Male: head transverse, tumid, occiput slightly depressed medially near posterior margin, lateral margins rounded, posterior margin almost straight but slightly concave medially. Eyes large, about as long as length of head behind the eyes. Antennal segments

moniliform, first segment short. Pronotum transverse, slightly widened posteriorly, similar in shape to that of *arachidis* (Fig. 38). Elytra rather longer than pronotum, posterior margin oblique and slightly concave; wings absent. Cuticle of head, pronotum, and elytra shining, impunctate, and glabrous. Legs normal for genus.

Abdomen depressed, basal two segments almost impunctate, tergite 3 slightly punctured, tergites 4–5 more strongly punctured, tergites 6–7 most strongly and closely punctured; lateral tubercles on tergites 3 and 4 small. Last tergite transverse, irregularly punctured except on a broad median longitudinal band which is smooth except for a few scattered punctures mainly along the median line; posterior margin of tergite oblique laterally, concave medially, and with a semi-circular depression near posterior margin, the diameter of the depression on the actual margin. Pygidium declivent, quadrate when viewed from a dorso-posterior position, postero-lateral angles slightly bifid. Each branch of forceps trigonal for basal third, dorsal surface with a raised ridge, the ridge slightly roughened medially; ventral edge of inner margin of branch wider near base, slightly sinuate, edges of margin finely dentated (Fig. 34).

Length: body 6 mm, forceps 2.25 mm.

Female: similar to male but tergites of abdomen less strongly punctured; forceps trigonal basally, cylindrical distally, ventral inner edge broadened basally and dentated but excavated at extreme base to accommodate the pygidium; a small inner tooth on each ventral edge before midpoint; pygidium small and quadrate (Fig. 35).

Length: body 7 mm, forceps 1.25 mm.

ST. VINCENT: ♂ holotype, ♀ allotype, St. Vincent, Antilles (Sharp) ex. coll. de Bormans (BM).

This species appears to be most similar to *Marava triquetra* Hebard, from Mexico, in which the forceps of the male have simple branches and the ventral inner edge is broadened at the base. The pronotum of *triquetra* was described as being subquadrate, however, whilst that of *quadrata* is transverse. The specific name of the present species refers to the quadrate pygidium of both sexes.

30. **Formicilabia caribea** Rehn & Hebard

Labia maeklini Burr, 1910 (not Dohrn, 1864), Proc. U.S. natn Mus. *38*: 455 (Dominican Republic).

Formicilabia caribea Rehn & Hebard, 1917, Bull. Amer. Mus. nat. Hist. *37*: 642 (Dominican Republic).

Formicilabia caribea Rehn & Hebard; Menozzi, 1931, Boll. Lab. agr. zool. Portici *25*: 323 (Dominican Republic).

A small shining species; head blackish-brown; antennae brown; pronotum and legs yellow; elytra dark brown, paler distally; wings dark brown, yellow at base; abdomen brown, darker laterally and on last tergite; forceps yellow and brown. Head with very large eyes, pronotum long, elytra and wings normally developed, abdomen wider medially; forceps trigonal, broad at base, inner margin dentated (Fig. 47).

Length: body 3.26 mm, forceps 1.09 mm.

Distribution: Dominican Republic, endemic.

Menozzi (1931) described the male and the male genitalia of this species, previously only known from the single female type.

SPARATTINAE

A distinctive subfamily, in which the species have the head and body flattened, and, except for one genus, is entirely Neo-tropical in distribution. Of the four Neo-tropical genera, one is represented in the Caribbean by two species.

Key to Caribbean species of Parasparatta

1. Dark brown or blackish, abdomen sometimes reddish posteriorly, male pygidium trifid at apex; female pygidium short, without tubercles . . . . . *Parasparatta nigrina* (Stal)
– Pronotum yellow, abdomen mainly reddish-brown; male pygidium not trifid at apex; female pygidium short and broad, and with tubercles . . . . . *Parasparatta dominicana* Brindle

31. **Parasparatta dominicana** Brindle

Parasparatta dominicana BRINDLE, 1971, Smiths. Contr. Zool. *63*:14 (♂ holotype, ♂, ♀, paratypes, including allotype, United States National Museum).

Head, elytra, and wings blackish; antennae dark brown; pronotum and legs yellow; abdomen reddish-brown, darker basally; forceps yellowish-brown. Head transverse, eyes small; pronotum quadrate, lateral margins straight; elytra and wings normally developed, pubescent; abdomen gradually widened distally, tergites punctured; forceps of male with each branch almost straight, and with a narrow ventral flange and an inner tooth about one third from base; pygidium pointed posteriorly (Fig. 42); forceps of female shorter, each branch with a ventral crenulated inner flange, and with one or more larger teeth.

Length: body 6-8 mm, forceps 2.5–3.5 mm (males), 1.5–2.5 mm (females).

Distribution: Dominica endemic.

32. **Parasparatta nigrina** (Stal)

Sparatta nigrina STAL, 1855, Ofvers. K. Vetensk. Akad. Forh. *12*: 350 (Brazil).
Parasparatta nigrina (Stal); BRINDLE, 1968, J. nat. Hist. *2*: 298 (Dominica).

Almost entirely blackish, tibiae dark brown, tarsi yellow or brown; last tergite or more may be reddish in colour, and sometimes forceps and pygidium are lighter brown or reddish. Head transverse, eyes small; pronotum small, parallel-sided; elytra and wings well developed; abdomen flattened, forceps of male with branches almost straight, inner margin with a very narrow flange and with three small teeth; pygidium long, apex trifid (Fig. 45); forceps of female broad, inner flange wider than in male and broadened basally, forming a tooth-like projection; one small inner tooth present; pygidium very short, transverse. (Fig. 46).

Length: body 5–6.5 mm, forceps 1.25–1.75 mm.

Distribution: Dominica. – Neo-tropical in World distribution, and recorded from Brazil and Argentine on the American mainland.

FORFICULIDAE

A large family, mainly Old World in distribution, but represented in the Neo-tropical Region by three subfamilies, of which two are recorded from the Caribbean. Characterized by the dilated second tarsal segment, and by the single distal lobe in the male genitalia.

FORFICULINAE

This subfamily is distinct by the short first antennal segment, which is shorter than the distance between the antennal bases; the abdomen is depressed, and not fusiform as in many of the species of the Opisthocosmiinae. Two genera and three species are recorded from the Caribbean, of which one is an adventive, one is endemic, and one is American in distribution.

Key to Caribbean species of Forficulinae

1. Fourth antennal segment short, about as long as fifth; male forceps broadened at base to form an inner flange on each branch, the flange dentated; distal part of each branch cylindrical and curved (Fig. 55) . . . . . *Forficula auricularia* Linnaeus
– Fourth antennal segment longer, as long as fifth; male forceps with branches slender, not broadened at base to form an inner flange; distal part of each branch only slightly curved . . . 2

2. Each elytron dark brown or blackish, with a yellow anterior spot, variable in size; wings yellow; male pygidium triangular, or spine-like, but spine short and broad (Fig. 58) . . . . . *Doru albipes* (Fabricius)
– Elytra yellowish, with sutures darkened; wings yellow darker along sutures; male pygidium spine-like, the spine slender (Figs. 56, 57) . . . . . *Doru taeniatum* (Dohrn)

33. **Forficula auricularia** Linnaeus

Forficula auricularia Linnaeus, 1758, Syst. nat. (10) 2: 423.
Forficula auricularia Linnaeus; Rehn, Catalog Orthoptera of Cuba, Second Report Central Experimental Station: 179 (Cuba).

Head reddish-brown, pronotum darker, lateral margins yellow; elytra and wings brown or yellowish-brown, sometimes darker; legs yellow; abdomen dark brown; forceps yellowish or partly darkened. Head transverse, eyes small; pronotum transverse, posterior margin convex; elytra and wings normally developed. Head, pronotum, elytra, and wings smooth, coriaceous. Each branch of male forceps broad at base, forming an inner flange, the margin of the flange irregularly dentated, but ending in a larger tooth; immediately distal to this tooth the branch is cylindrical, and strongly curved (Fig. 55); forceps of female simple, branches almost straight and contiguous.

Length: body 9–12 mm, forceps 3–5 mm.

Distribution: Cuba, adventive. – Mainly Palaearactic in World distribution but recorded as an adventive in many countries throughout the World. The species may become established in countries which have a temperate or subtropical climate.

34. **Doru albipes** (Fabricius)

Forficula albipes FABRICIUS, 1787, Mantissa Ins. *1*: 224 (West Indies).
Forficula bimaculata BEAUVOIS, 1817, Ins. rec. Afr. Amer., Orth.: 165 (Dominican Republic).
Sphingolabis albipes (Fabricius); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (Dominican Republic).
Doru albipes (Fabricius); BURR, 1910, Proc. U.S. natn Mus. *38*: 464 (Dominican Republic).
Phaulex albipes (Fabricius); BURR, 1912, Annln naturh. Mus. Wien *26*: 100 (Cuba; "Insel St. Jan"?)
Doru albipes (Fabricius); REHN & HEBARD, 1917, Bull. Amer. Mus. nat. Hist. *37*: 649 (St. Thomas; St. Croix; Dominica; Puerto Rico).
Doru albipes (Fabricius); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 324 (Dominican Republic).
Doru bimaculatum (Beauvois); MENOZZI, 1931, Boll. Lab. agr. zool. Portici *25*: 325 (Dominican Republic).
Doru albipes (Fabricius); BRINDLE, 1971, Smiths. Contr. Zool. *63*: 22 (Dominica).

Head blackish; antennae brown with basal two or three segments yellow; pronotum yellow with two longitudinal blackish bands, which are sometimes narrow, or wider, and may cover most of the pronotum; each elytron dark brown or blackish, with a yellow anterior yellow spot, variable in size; wings yellow; legs yellow; abdomen blackish, forceps dark red or darker; head transverse,

eyes small; pronotum transverse, posterior margin convex, elytra and wings normally developed; last tergite of male with four tubercles near posterior margin, arranged transversely. Forceps of male with each branch evenly curved or sinuate, without an inner tooth, pygidium triangular or with a blunt spine (Fig. 58); forceps of female short, each branch almost straight, somewhat sinuate. Genitalia with long parameres (Fig. 59).

Length: body 8–15 mm, forceps 2.5–10 mm (males), 2–2.5 mm (females).

1° – "dans la forme melanisante, dont les taches élytrales sont invisibles" (BONFILS)
GUADELOUPE: Massif de la Soufrière, Forêt des Bains-Jaunes, 800 m, 15.VI. 1963, 1 sp.; Sources du Galion, dead Clusia, 1000 m, 15.VIII.1960, 1 ♀; Savane-à-Mulets, 1000 m, 12.IV.1963, 1 ♂; La Citerne, 1200 m, 6.IX.1965, 2 ♀; Matouba, Sources Riv. Rouge, 800 m, 12.I., 1966, 2 sp.; Pointe-Noire, Morne-à-Louis, 600 m, 2.III.1966, 1 ♂ (B).
MARTINIQUE: Sainte-Marie, Forêt de Fourniol, 300 m, 30.VII.1965, 1 ♂ (B).

2° – "dans la forme 'typique' avec taches elytrales visibles" (BONFILS)
GUADELOUPE: Gourbeyre, V.1952, 1 ♂ (L. Berland, Museum Paris); Duclos, Centre Rech. Agron., 250 m, 27.XII.1955, 1 ♀; VIII.1956, 1 ♂ (R. Benard); XII.1962, 1 ♂; II.1963, 1 ♀; VI.1963, 1 ♂; Sainte-Rose, Piton, 300 m, forêt, 23.VII.1965, 4 ♀; Route des Mamelles, 400 m, 25.VI.1964, 1 ♂; Morne-à-Eau, Sauvia, 20 m, royal palm, 18.III.1966, 1 ♂ (B).
MARTINIQUE: Sainte-Marie, Forêt de Fourniol, 300 m, 30.VII.1965, 1 ♂ (B).

Distribution: Apparently widely distributed on the Caribbean islands, and endemic.

35. **Doru taeniatum** (Dohrn)

Forficula taeniata DOHRN, 1862, Stettin. ent. Ztg. *23*: 230 (Mexico).
Forficula taeniata Dohrn; BOLIVAR, 1888, Mém. Soc. zool. France *1*: 7 (Cuba).
Sphingolabis linearis CAUDELL 1907 (not Eschscholtz, 1822), Jl. N.Y. ent. Soc. *15*: 169 (Cuba).
Sphingolabis californica (Dohrn); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 169 (Cuba).
Doru lineare BURR, 1910 (not Eschscholtz, 1822), Proc. U.S. natn Mus. *38*: 464 (Cuba).
Doru lineare BURR, 1912 (not Eschscholtz, 1822) Annln naturh. Mus. Wien *26*: 99 (Cuba).
Doru lineare REHN & HEBARD, 1917 (not Eschscholtz, 1822), Bull. Amer. Mus. nat. Hist. *37*: 648 (Cuba).
Doru taeniatum (Dohrn); BRINDLE, 1971, Pap. Av. S. Paulo *23*: 191.

Head and pronotum blackish or dark brown, the latter with yellow lateral margins; elytra and wings yellow, sutures and lateral margins dark brown or blackish; legs yellow; abdomen blackish or nearly so. Head transverse, eyes small; pronotum transverse, posterior margin nearly straight; elytra and wings normally developed; abdomen strongly punctured. Each branch of male forceps slender, widely separated at base, with an inner tooth (*taeniatum*, Fig. 56) or without (*californica*, Fig. 57); pygidium spine-like; forceps of female simple, branches nearly contiguous.

Length: body 12–14 mm, forceps 5–5.5 mm (males), 3.5–4.5 mm (females).

Distribution: Cuba. – Neo-tropical and Nearctic in World distribution, and recorded from Colombia and Bolivia northwards to the southern United States.

OPISTHOCOSMIINAE

This subfamily is characterized by the very long first antennal segment, which is longer than the distance between the antennal bases, by the long slender distal antennal segments and the long slender legs. The body is usually fusiform and the elytra is often short and wings absent; the branches of the male forceps are usually relatively simple, sometimes with inner teeth but without dorsal teeth; the abdomen never bears lateral appendages in the male.

BURR (1911) places *Cipex schwarzi* in the subfamily Anechurinae, but this subfamily is very closely related to the Forficulinae and is characterized by the broad abdomen and the short first antennal segment, the latter character also shared with the Forficulinae. *Anechura elongata* Bormans is also not a true *Anechura*, most evident by the long slender body. Since both of these species have long first antennal segments, and relatively long and slender branches in the male forceps, both are placed here in the Opisthocosmiinae. *Anechura elongata* is herewith transferred from the genus *Anechura*, and placed in the genus *Cipex*. This genus is characterized by the short first tarsal segment which is dilated distally; this character is very pronounced in *schwarzi* (Fig. 50) and much less so in *elongata* (Fig. 54).

Three species in two genera occur in the Caribbean, of which one genus and two species are endemic to Cuba.

KEY TO CARIBBEAN GENERA AND SPECIES OF OPISTHOCOSMIINAE

1. Basal tarsal segments long and slender, not dilated distally; abdomen fusiform (Fig. 61) . . . . . *Kleter rehni* (Burr)
- Basal tarsal segments short and dilated distally (Figs. 50, 54); abdomen depressed, almost parallel-sided or wider medially . 2

2. Basal tarsal segments very short (Fig. 50); pronotum transverse, not widened posteriorly (Fig. 51). . . . *Cipex schwarzi* (Rehn)
- Basal tarsal segments longer (Fig. 54); pronotum widened posteriorly, and longer than broad (Fig. 48) . . . . . *Cipex elongata* (Bormans)

36. **Cipex elongata** (Bormans) comb. nov.

Anechura elongata Bormans in BOLIVAR, 1888, Mém. Soc. zool. France 1: 5 (♂ holotype, Cuba; Institute of Biology, Academy of Sciences of Cuba).

A long, slender species (Fig. 48). Head reddish, pronotum yellow, disc orange, and a median longitudinal band brown; elytra and wings yellowish-brown, sutures and external margins paler in colour; abdomen dark reddish-brown; legs yellowish-brown, pygidium reddish; forceps as abdomen. Head broad; pronotum longer than broad, strongly widened posteriorly, posterior margin convex; elytra and wings fully developed; abdomen long, slender, depressed, last tergite large, posterior margin more or less truncate, depressed medially near posterior margin, and with three longitudinal ridges, the outer ones rather oblique. Each branch of male forceps long, slender, slightly sinuate (Fig. 52, 53), broader at extreme base where there is an inner tooth; distal part with three inner teeth, the first tooth about one-third from base being small, the median tooth about two-thirds from base, being large and directed slightly ventromedially, whilst the third tooth, at about three-quarters from base

being small; pygidium transverse, large, posterior margin with two prominent teeth (Fig. 52). Tarsi Fig. 54.

Length: body 13 mm, forceps 5 mm.

Distribution: Cuba, endemic.

Only known from the single type specimen. The above description is taken from the original description, supplemented by the study of an excellent photograph of the type supplied by Pastor ALAYO D. BOLIVAR (1888) states that the specimen is a male.

37. **Cipex schwarzi** (Rehn)

Forficula schwarzi REHN, 1905, Proc. U.S. natn Mus. *29*: 513 (♀ holotype, Cuba; U.S. National Museum).

Sphingolabis schwarzi (Rehn); CAUDELL, 1907, Jl. N.Y. ent. Soc. *15*: 170 (description of male).

Cipex schwarzi (Rehn); BURR, 1910, Proc. U.S. natn Mus. *38*: 462 (notes on the type specimen and the male).

Head, pronotum, elytra, and wings yellowish-brown, elytra darker on sutural and lateral margins, wings darkened laterally; legs yellowish; abdomen reddish to yellowish-brown, last tergite reddish; forceps yellow with the inner basal teeth blackish. Head, without mouthparts, transverse, eyes small; first antennal segment long, cylindrical, only slightly wider distally, longer than the distance between the antennal bases; pronotum as broad as long, lateral margins rounded, posterior margin convex; elytra and wings long (Fig. 51). Legs long, tibiae shorter than femora, tarsi short, first (basal) segment in all legs shorter than both distal segments combined, and broadened distally, second segment short, broadened distally, third (distal) segment slender (Fig. 50). Abdomen wider medially, last tergite large and quadrate, posterior margin oblique laterally, truncate medially; forceps of male with each branch long, slender, gradually tapering from base to apex, and with three inner teeth, the tooth nearest the base small and directed ventro-medially, the largest tooth being the middle one, which is almost medially directed, the third tooth similar in size and direction to the first tooth; pygidium spine-like (Fig. 49); forceps of female

long, each branch with the base widened to form an inner tooth, distal part slender, with inner crenulations, and with apex strongly curved medially; pygidium short (Fig. 51).

Length: body 14.5 mm, forceps 14 mm (male), 6.2 mm (female).

Distribution: Cuba, endemic. – Only known from the type female and male specimen, both from Cayamas, Santiago Province.

38. **Kleter rehni** (Burr)

Sarcinatrix rehni BURR, 1907, Trans. ent. Soc. Lond. *1907*: 103 (San Esteban).
Dinex rehni (Burr); BURR, Genera Insectorum *122*: 94.
Kleter rehni (Burr); BRINDLE, 1969, Entomologists' mon. mag. *105*: 113.

Head reddish-brown; pronotum blackish, widely yellow laterally; elytra and wings brown, sometime darkened along sutures; legs yellow; abdomen dark reddish-brown, lateral parts sometimes darker; forceps reddish-yellow. Head transverse, eyes large, and antennal segments long and slender. Pronotum small, transverse, posterior margin strongly convex. Elytra and wings normally developed; legs long, slender; abdomen fusiform. Each branch of male forceps slender, simple, widely separated at base from the other branch, penultimate sternite of male with a small lateral projection, visible from a dorsal view (Fig. 60); forceps of female with branches slender, long, but contiguous. (Fig. 61).

Length: body 9–11 mm, forceps 3–4 mm.

TRINIDAD: Spring Hill Estate, Arima Valley, 9.III.1964 (C. E. Ross) 1 ♀ (CAS).

Distribution: Trinidad. – Neo-tropical in World distribution and recorded from Venezuela and Mexico. The above record for Trinidad is the first for the Caribbean.

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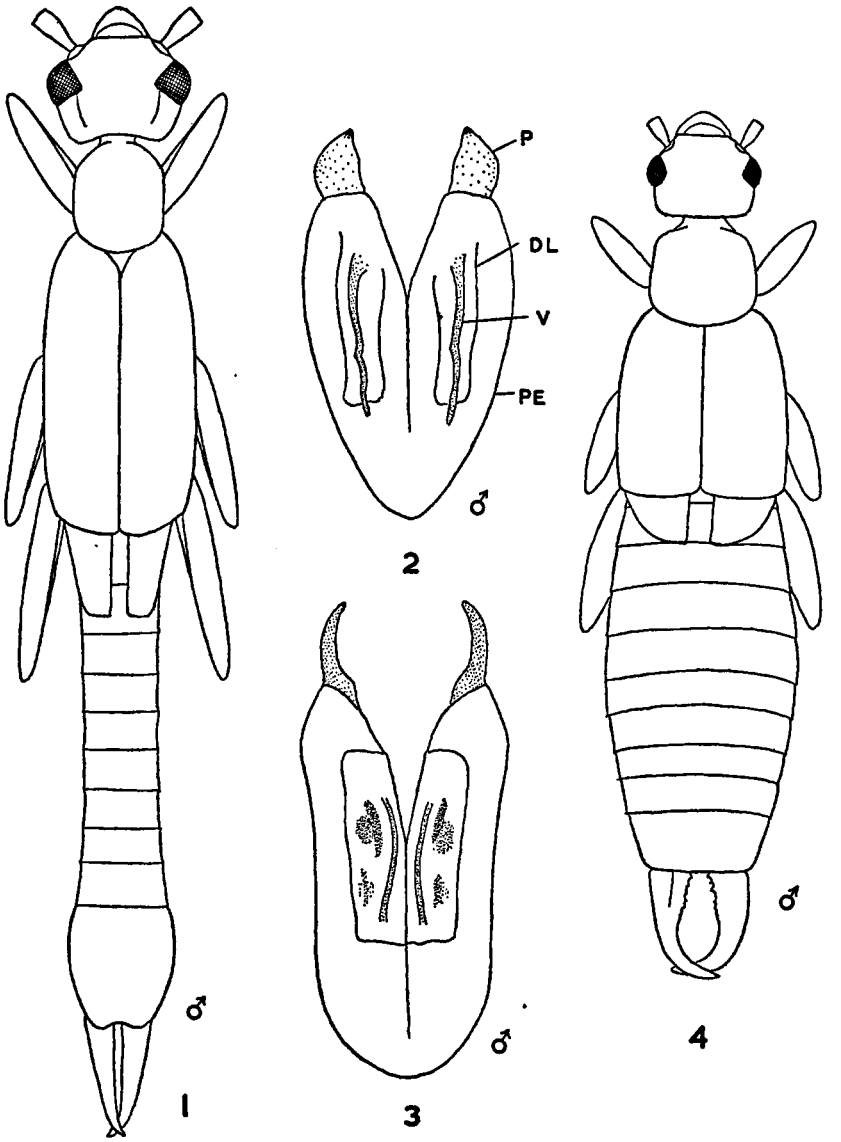
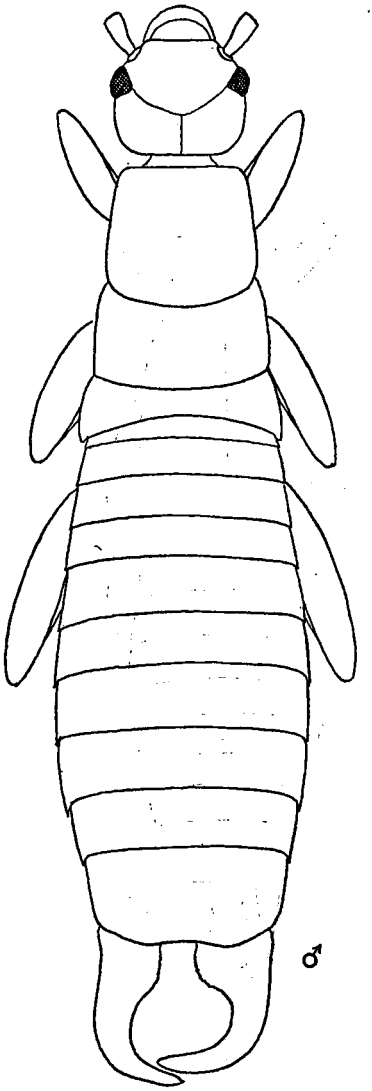


Cylindrogaster sahlbergi – 1, dorsal view; 2, genitalia. (DL = distal lobe; P = paramere; PE = penis; V = virga). *Pyagropsis buscki* – 3, genitalia; 4. dorsal view.



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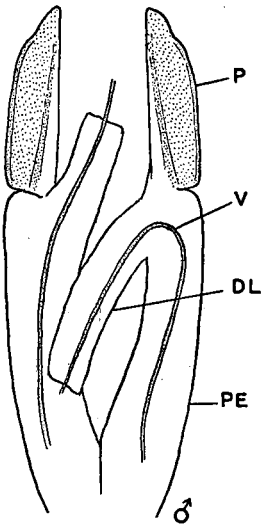

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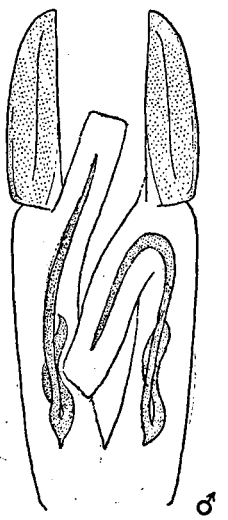

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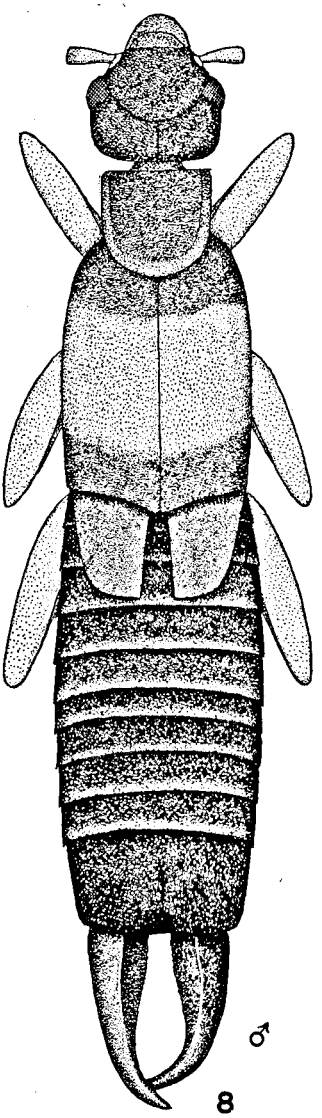

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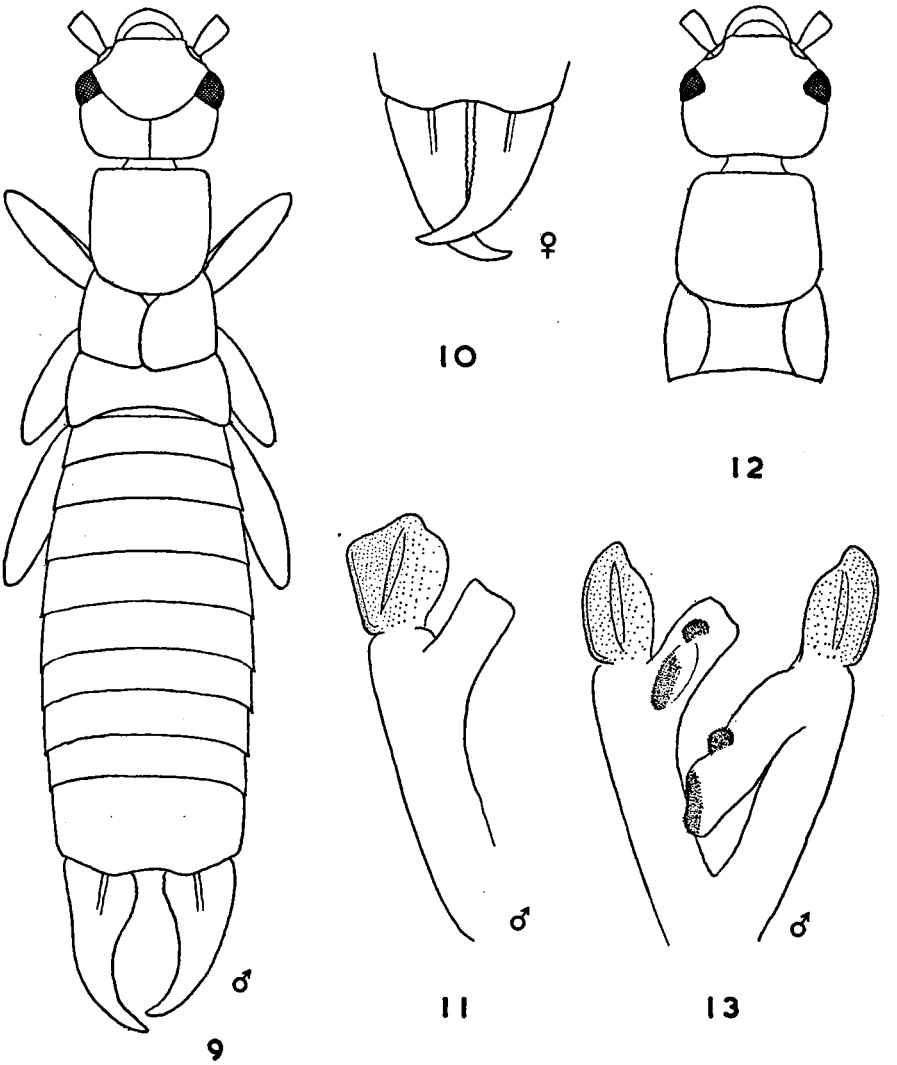
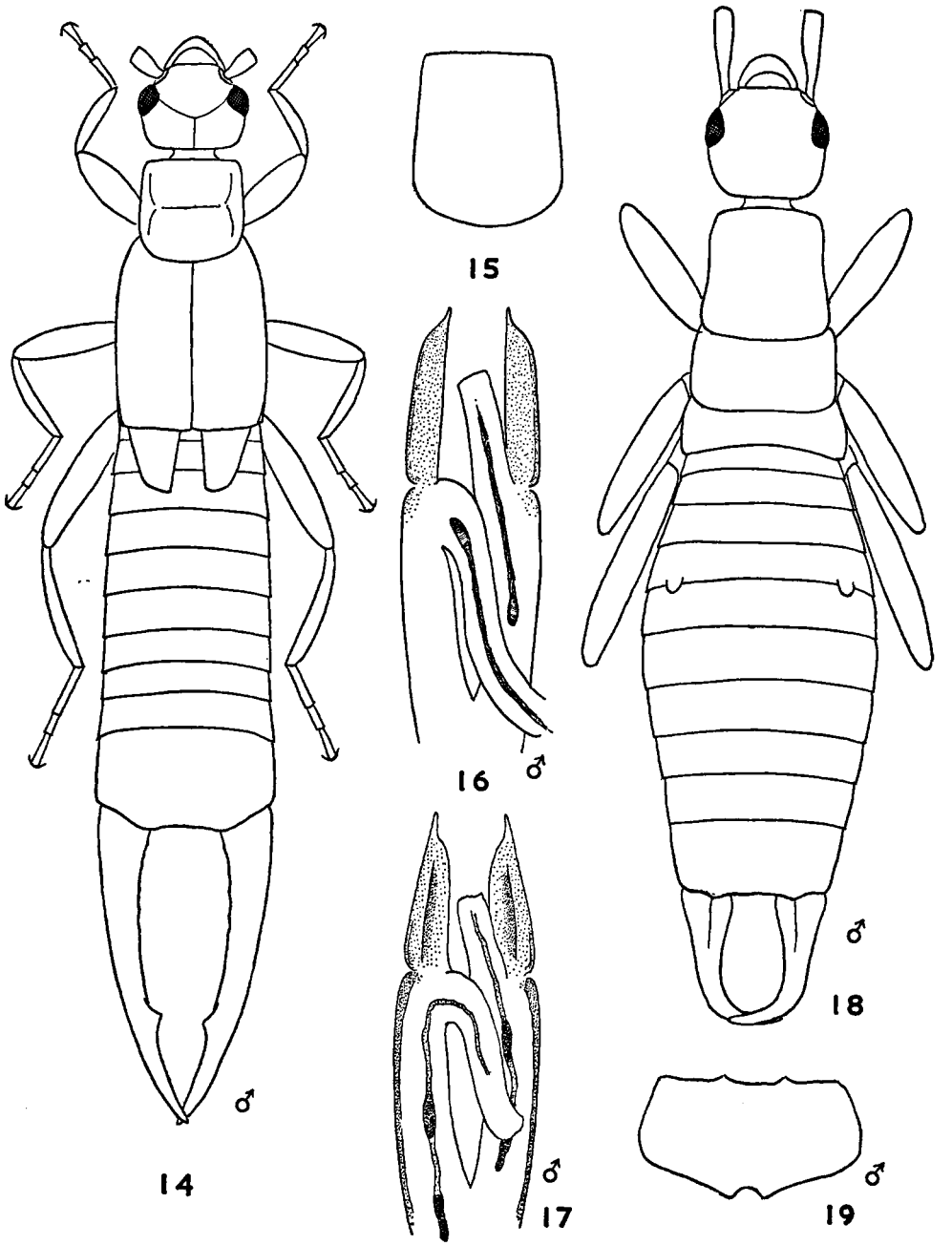
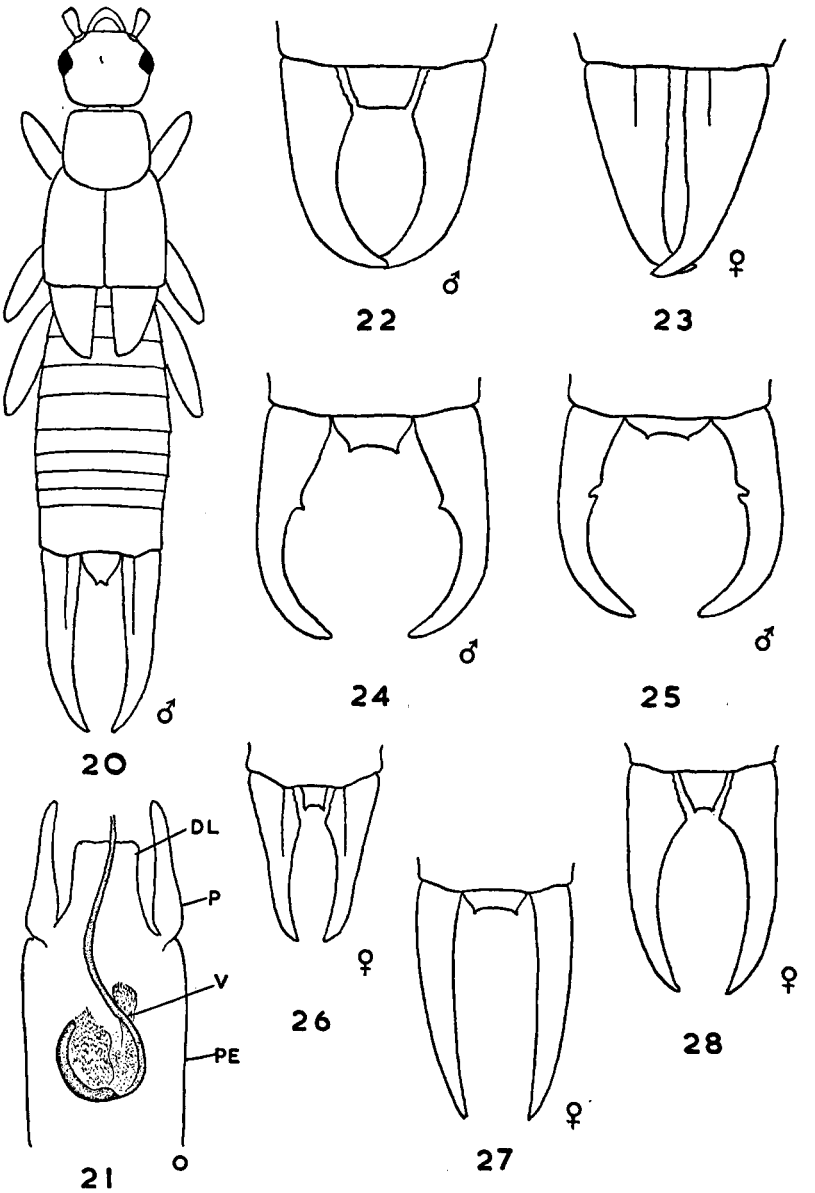
Anisolabis maritima – 5, dorsal view; 6 genitalia. (DL = distal lobe; P = paramere; PE = penis; V = virga). *Carcinophora americana* – 7, genitalia; 8, dorsal view.



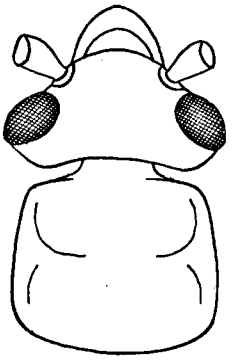
Euborellia caraibea – 9, dorsal view; 10, forceps; 11, genitalia. *Euborellia stali* – 12, head, pronotum, and elytra; 13, genitalia.



Labidura riparia – 14, dorsal view; 16, genitalia. *Labidura xanthopus* – 15, pronotum. *Brachylabis allardi* – 17, genitalia; 18, dorsal view; 19, penultimate sternite.



Labia pilicornis – 20, dorsal view; 21, genitalia; 26, forceps. (DL = distal lobe; P = paramere; PE = penis; V = virga). *Labia curvicauda* – 22–23, forceps. *Labia dorsalis* – 24 & 28, forceps. *Labia arcuata* – 25 & 27, forceps.



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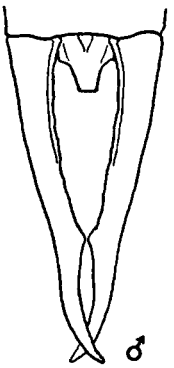
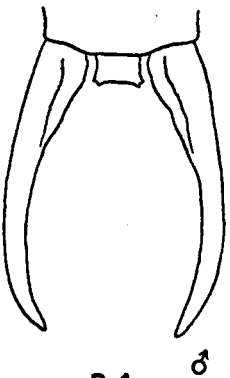
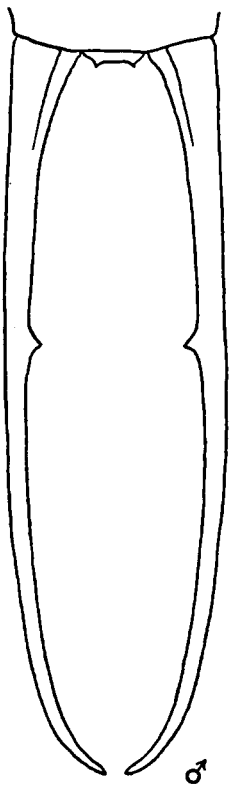


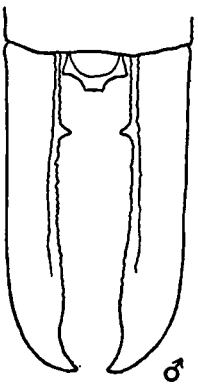
31



34



30



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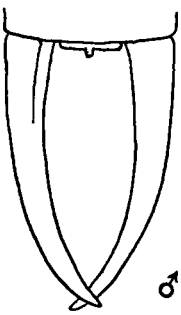

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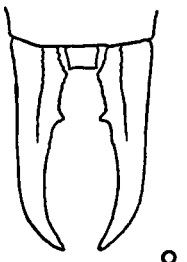

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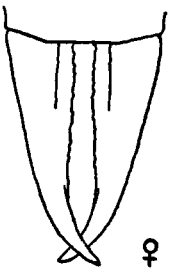
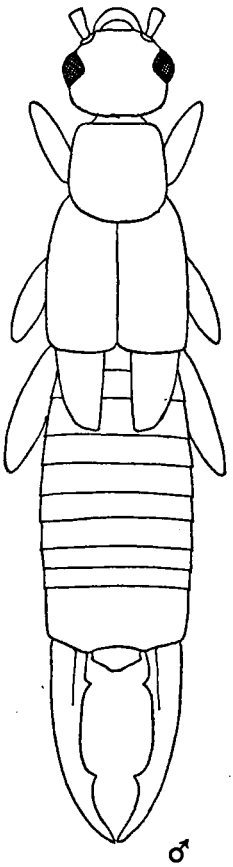


36

Spongiphora croceipennis – 29, head and pronotum; 30, forceps. *Vostox cabrerae* – 31, forceps. *Vostox insularis* – 32, forceps. *Spongovostox ghilianii* – 33, forceps. *Marava quadrata* – 34–35, forceps. *Marava* modesta – 36, forceps.



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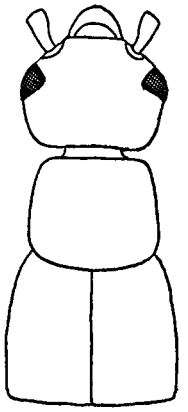

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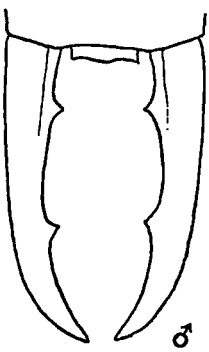

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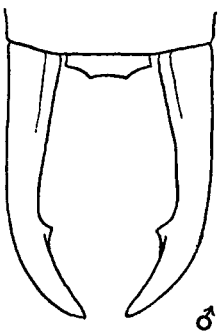

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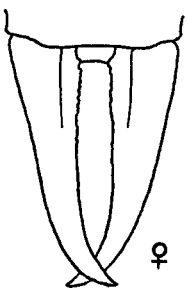
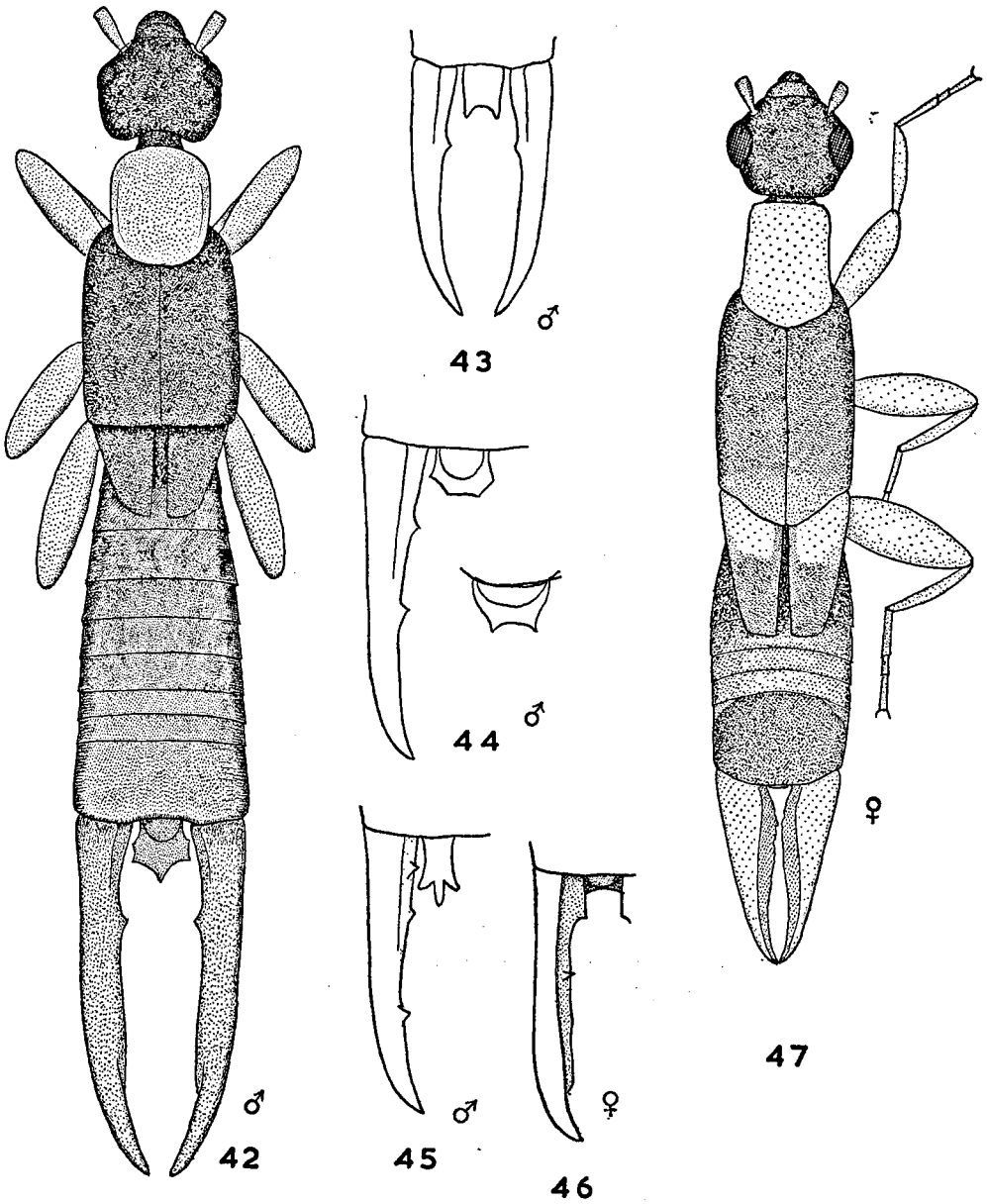
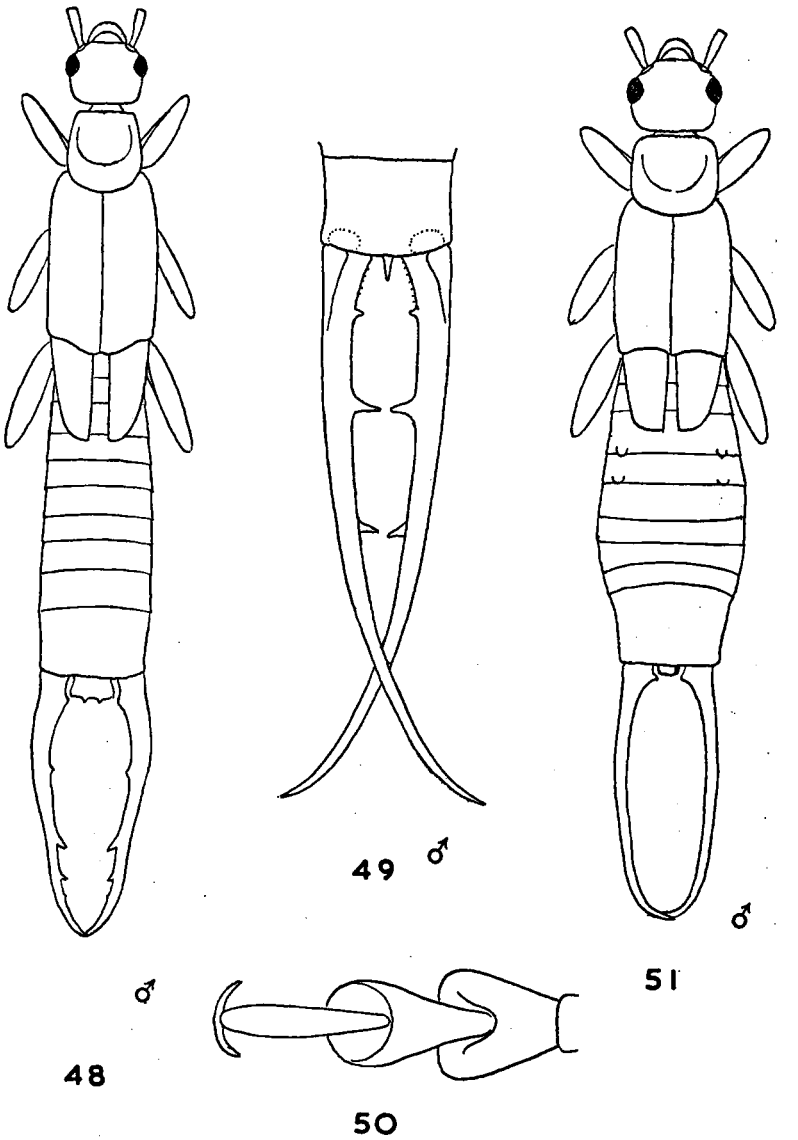


41

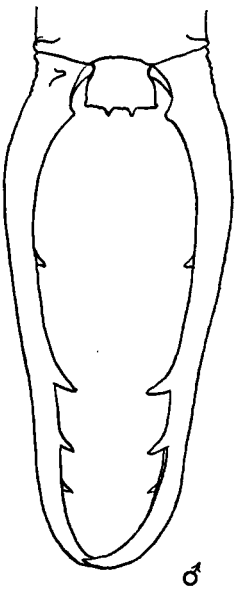
Marava unidentata – 37, dorsal view; 41, forceps. *Marava arachidis* – 38, head, pronotum, and elytra; 39, forceps. *Marava pulchella* – 40, forceps.



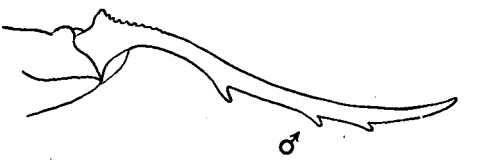
Parasparatta dominicana – 42, dorsal view. *Parasparatta nigrina* – 45–46, forceps. *Marava dominicae* – 43, forceps. *Marava jamaicana* – 44, forceps and pygidia. *Formicilabia caribea* – 47, dorsal view.



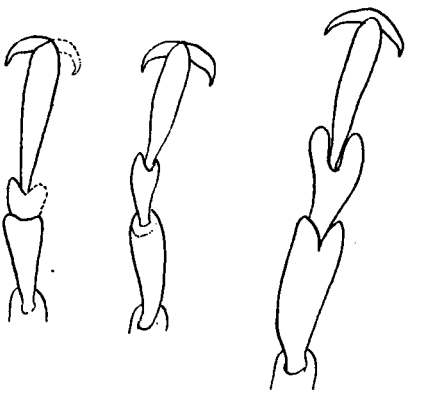
Cipex elongata – 48, dorsal view. *Cipex schwarzi* – 49, forceps; 50, tarsus; 51, dorsa view.



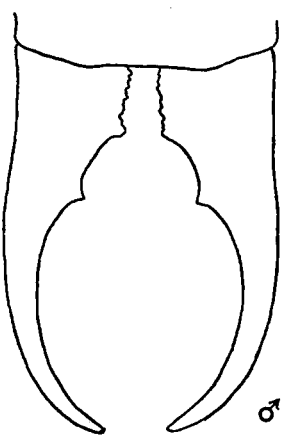
52



53



54



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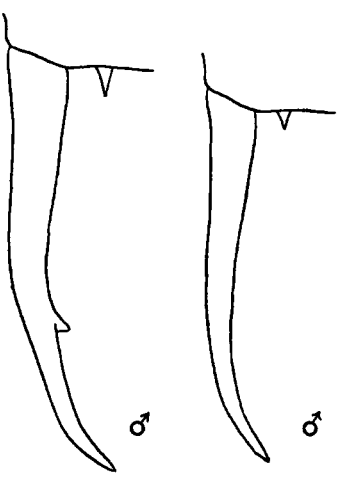
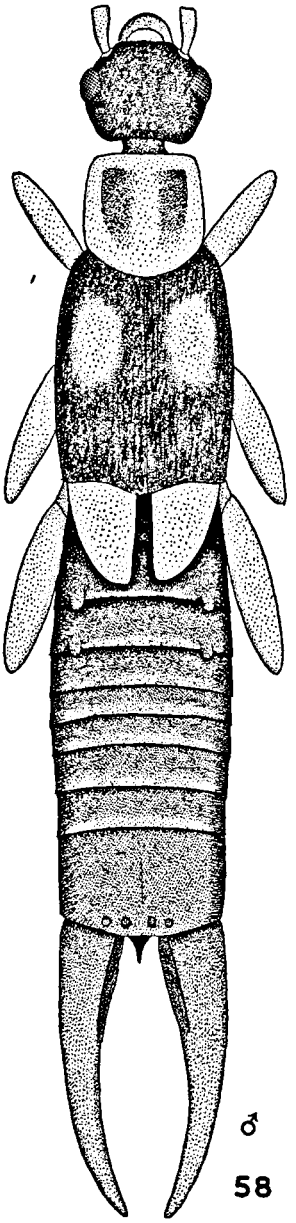
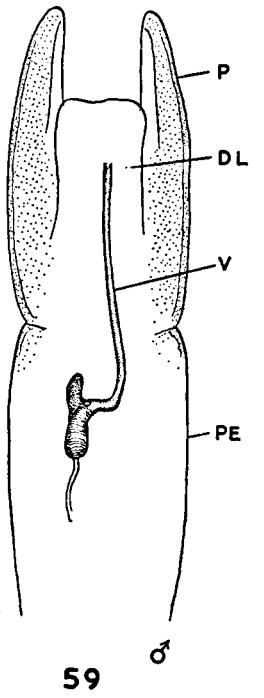
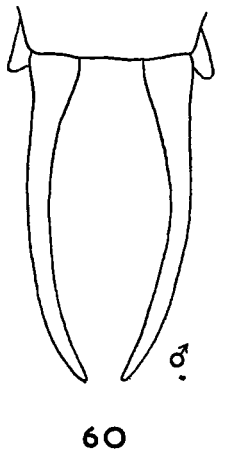


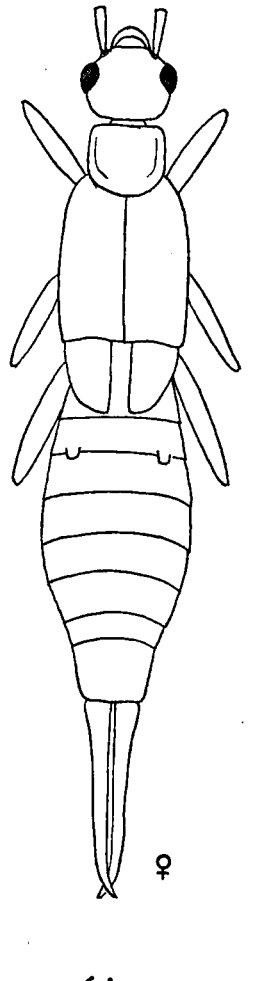
56 57

Cipex elongata – 52–53, forceps, dorsal and lateral; 54, tarsi of first, second, and third pair of legs. *Forficula auricularia* – 55, forceps. *Doru taeniatum* – 56, left branch of forceps. *Doru taeniatum* forma *californica* – 57, left branch of forceps.









Doru albipes – 58, dorsal view; 59, genitalia. (DL = distal lobe; P = paramere; PE = penis; V = virga). *Kleter rehni* – 60, forceps; 61, dorsal view.